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UNIVERSITY OF TORONTO *Faculty  
of Medicine*

REPORT OF THE DEAN  
OF THE  
FACULTY OF MEDICINE



SESSION 1937-1938

# UNIVERSITY OF TORONTO

## FACULTY OF MEDICINE

*Toronto, June 30, 1938.*

*To the Graduates in Medicine of the University of Toronto.*

*The Annual Report of the Dean of the Faculty of Medicine  
for the Session 1937-1938 is, with good wishes and greetings,  
sent to you herewith.*

*W. E. Gallie, M.D.,  
Dean.*

# THE ANNUAL REPORT OF THE DEAN OF THE FACULTY OF MEDICINE

W. E. GALLIE, M.D., F.R.C.S. ENG.

The many letters received from graduates who have read recent annual reports from the Faculty of Medicine have indicated clearly that the plan of issuing it in the form of a letter designed to keep them in touch with all the activities of the School is much appreciated and should be continued. As in last year's report, therefore, the Dean will comment upon matters of general interest to the whole faculty, and the heads of the various departments will discuss those subjects, both scientific and administrative, that have been of interest in their particular fields.

As indicated in the report of last year, the Faculty Council has been much concerned with the increasing numbers of students who desire to register in this School and with the low level of scholastic aptitude shown by many of them. As it is quite impossible to keep up the standard of clinical instruction in the three final years if the hospitals are overrun with students, all possible ways of keeping the numbers within reasonable limits have been considered and every suggestion studied which might lead to a selection of those that are most likely to be successful.

As this question of how many students shall be accepted and who they shall be is of the utmost importance to the School and as a definite policy in regard to it has now been decided upon, it would seem that the time is ripe for a frank discussion of the subject with the graduates.

Twenty years ago, from seventy to a hundred freshmen who held the matriculation standing of that time were admitted from Ontario and the other provinces, with an occasional student from the United States and other foreign countries. By the time they graduated the numbers had usually diminished by ten per cent. Then came the Rockefeller report on medical education and the almost immediate closing of hun-

dreds of medical schools on this continent and the enormous raising of standards of both premedical and medical education. In Toronto the Matriculation was raised from the pass to the honour standing and the medical course was lengthened first from four to five years and then to six. Many schools have required that students entering Medicine shall hold a degree in the Natural Sciences, but so far we have not insisted on this but have attempted in a six year course to give the student an adequate training in the medical sciences and a slight contact with some of the purely cultural Arts subjects. With this changing of the curriculum has come an enormous improvement in the courses given in both the preclinical and the clinical years, so that our School has been able to reach and to maintain a position, as indicated by the Rockefeller reports, among the best schools on the continent.

Coincident with the sharp reduction of the number of schools and the general raising of the standards of medical education throughout America, many of the Schools abruptly reduced the number of freshmen accepted to 50 or 60, the number that could be handled satisfactorily in their associated hospitals. Naturally the selection committees picked out those applicants who appeared to be the best. I understand that nowadays such Schools as Western Reserve, Rochester and Buffalo select 50 or 60 freshmen from nearly a thousand applicants who hold their entrance qualifications and the result has been that we have been finding it increasingly difficult to compete with these Schools in the average of the intelligence of the students.

With this great general reduction in the opportunity for registration there has been a steadily increasing pressure for admission to Toronto and some years ago it became necessary to increase the restrictions. Bearing in mind that this School is supported by the Province of Ontario, these restrictions have not yet been applied to its citizens. They have, however, been applied stringently to the citizens of other countries and to a lesser degree to citizens of our sister provinces. Thus each year we have approximately five hundred applications from Americans but these are all declined. There are a certain number of applications from sons and daughters of our own graduates who live in the United States or elsewhere and from these

we select only those who show aptitude for a prolonged course of study. This has caused some resentment on the part of some of our graduates but we hope they will appreciate the great changes that have developed since their day and accept the general principle that this School must serve primarily the citizens of Ontario.

Besides providing educational opportunity for young men and women from this Province, we must also lend assistance to the other provinces, particularly those who have no Medical Schools. In the case of British Columbia and New Brunswick, which have no Medical Schools, we accept graduates in Arts who have covered the natural sciences and also students who have taken the first two years of that course. Such students are accepted into our second year if their academic record indicates that they may be expected to make satisfactory progress. With the University of Alberta we have an agreement by which students in either school may transfer to the other provided all subjects in the previous year have been completed. The University of Saskatchewan has a course which coincides fairly well with our preclinical years. It is a four year course leading to a B.Sc. or a B.A. degree. We accept such graduates into our fourth year if their records are satisfactory. We also accept into our second year some students from Saskatchewan and Western Ontario who have completed satisfactorily their first two years, provided the number registered in our second year is not already excessive. In the case of St. Francis Xavier and Acadia Universities in Nova Scotia, and McMaster and Ottawa in Ontario, we accept into our second year graduates or students who have completed courses equivalent to our first year. From Alberta, Manitoba, McGill, Dalhousie and Queen's we consider applications for admission to the next higher year at Toronto provided equivalent courses have been completed and the applicant's record has been without stain, failures or poor reports from his school.

Before the period of overcrowding of our Medical Schools began, the previous record and aptitude of applicants from other Universities and provinces were not considered very carefully, but for the past few years this has had to be changed and now no students are accepted from outside Ontario who

cannot be classified as good students. They always may be found in the upper third of the class.

But in spite of these restrictions, lengthenings of the course and general raising of standards, the overcrowding has continued. Three years ago there were 450 students in the three clinical years. This is an intolerable condition from many standpoints but from two in particular. Firstly, it is impossible in a city such as Toronto to give an adequate training in the principles of Medicine, Surgery and Obstetrics to 450 students. Secondly, it is an outrage on the patients in our public wards to force them to submit to continual use as clinical material for teaching. The Faculty determined, therefore, that in some way or other the number of students in the clinical years must be reduced to approximately 100 in each year.

In examining the plan of selection of freshmen in the Class A Schools in the United States and in such Canadian Schools as McGill, Queen's, Western Ontario, and Manitoba, we found the method simple. Each school has a definite limit to the number of freshmen who will be accepted, usually between 25 and 75, and from the mass of applications the requisite number of the brightest students are selected. The choice is based on previous scholastic record, recommendation by head masters of schools, personal interview and standing in the so-called "Scholastic Aptitude Test for Medical Schools" concerning which something will be said later. This method could not be adopted in the University of Toronto, however, as here we have a definite matriculation standard which gives any Ontario student who has it, no matter how long he took to obtain it, the right to register.

In searching for other plans of selecting students a study of the whole scholastic and academic records of large groups was made by the Assistant Dean, Dr. E. S. Ryerson. This showed conclusively that students with poor records in high school and in Arts courses almost invariably did badly throughout their medical course and that students who had failures in their freshman year almost always had failures in subsequent years and either failed to graduate or did so only after repetition of whole courses of study. It was determined, therefore, that while no limit could be placed on the number of students from Ontario who might wish to register in the freshman year

(provided they had their senior matriculation), it would be wise to allow only those to advance to the second year who had shown aptitude for medical studies. It must be agreed that the kindest way to deal with the poor student and his parents is to drop him at the earliest possible moment from a course of study for which he has no aptitude.

As indicated above the freshman year is really a premedical year during which the student studies in lecture hall and laboratory the fundamental sciences, physics, chemistry and biology. In addition he elects one Arts subject, usually French or German, and he attends a course of lectures on the History of Science and Civilization. It is a full year and forms an excellent educational basis for the Medical course.

The first step in developing a plan of selection consisted of raising the passing standard in the First Year in the three sciences. Previously a mark of 50% in each subject constituted a pass. This has been changed in that while 50% is still the passing mark in each subject, an average of 60% must be obtained in the total of the three sciences. No supplemental examinations are allowed in these three subjects. While this does not appear to be an important change, it nevertheless reduced the number with a clear pass to a level that could be handled in the clinical years. We were annoyed to find, however, that the following Autumn most of those who had been ploughed returned for re-registration in the first year in spite of strong advice to the contrary, and as there was no way of preventing this re-registration, the first year was larger than ever. As might be expected, these repeaters nearly all scraped through in the following Spring examination, for only mental defectives could fail to pass this examination after two whole years of preparation for it.

This experience demonstrated that nothing short of strict methods of selection could be effective and it was accordingly determined to add to the existing regulations that students who failed in their first year examination could not re-register in the first year. This regulation comes into force this year and it should do something towards reducing the number of students to a level where each can expect to receive adequate training and where the general standard of intelligence will be equal to the work for which they are to be trained.

This final step in establishing methods of selection was taken only after grave consideration and with full realization that occasional mistakes might be made in dropping from the School students who might ultimately have achieved success in their studies and practice. To reduce this chance to a minimum, a system of recording the term work has been established and a series of test examinations introduced in order that the instructors may acquire early some knowledge of the application and ability of the students. When the results of the final examinations are considered, the whole record of those students who have failed, throughout high school and medical college, is reviewed and every effort made to eliminate mistakes. To lessen the hardship to those who have failed simply because they had selected the wrong course, the way is still open for them to register in the first year in any other course in the University, or, if they have obtained a 50% standing in the subjects of the freshman year in Medicine, to apply for admission to the second year of the Pass Arts Course.

In determining the fate of borderline students, the Scholastic Aptitude Test of the Association of American Medical Colleges is likely to prove helpful. This test is applied to applicants for admission to most Class A American Medical Schools, during their premedical years in college. Last year we submitted our first year to the test early in December and were much interested to find that the standing obtained by the students in this very general test of intelligence, memory, powers of observation, general information, and so on, agreed very closely with students' records throughout the year and at the final examination. The test should be useful, therefore, in helping us to make the best selections for promotion to the second year.

Two years ago a committee of the Faculty was appointed to study the whole Medical curriculum and to recommend whatever changes might lead to its improvement. At the end of the first year of the study the committee reported on the curriculum of the first, second and third years and recommended a general reduction of the number of hours devoted to both laboratories and lectures. They formed the opinion that with the passage of time, the various departments had tended to introduce much that was of special and advanced character

into their courses and had forgotten that for the average medical student a firm grasp of principles is what is desired. In the view of the Committee the objects of the whole pre-clinical period of a Medical curriculum ought to be (1) to introduce the student to scientific method and to imbue him with the scientific habit of mind, (2) to induce in him correct habits of learning and the faculty of independent inquiry, and (3) of course, to equip him with such a body of fully assimilated scientific information as will form an adequate and enduring basis for his later, more purely professional studies. Each Department has tended to elaborate its courses to the fullest possible extent, and with this object has sought the largest attainable share of the student's time. The result is that the curriculum has become overloaded in content, and overcrowded in time. The student has no time for individual study and reading—no encouragement therefore to teach himself. His one duty he feels, and is practically made to feel, is to commit to memory a certain mass of information; and, having discharged this at an examination, to replace it as completely as possible by another. The Faculty is convinced that the results of this system are not good and that a general reduction of the time devoted to lectures and laboratory classes would probably produce an improvement. The remedy is not simple.

One of the most important changes has been made at the request of the Professor of Pathology, Dr. Wm. Boyd. Hitherto, Pathology has been taught in the fourth and fifth years synchronizing with the clinical teaching, but according to the new plan it has been moved back into the third and fourth years. This was made possible by the reduction of the time devoted to chemistry, physiology and anatomy and it has the great advantage that when the student commences his clinical work at the beginning of the fourth year, he has some knowledge of the principles of pathology and when he enters the fifth year, which is the year of intensive study of disease, he has already covered the special pathology of the common diseases.

This year the Committee on Curriculum completed its study of the three clinical years and made the same criticism as in the report on the primary years, that while the courses

have been, on the whole, of excellent quality, some of them have been over-elaborated so that the student, busy in the acquisition of a mass of detail, loses sight of the principles of the subject and of its real place in the science and art of Medicine. The changes recommended and adopted were as follows:—

1. *Bacteriology* (third year)—A reduction from 165 hours to 120 hours, a change that partly balances the introduction of 45 hours of pathology in the third year.
2. *Pathological Chemistry*: A reduction of the laboratory course from 60 hours to 40 hours. The lecture course will be of the same length but will begin in the third trimester of the fourth year and be completed in the first trimester of the fifth year. This change has two advantages: first, that it correlates more closely the lectures with the laboratory work, and second, it relieves to a certain extent the already overcrowded fifth year. This change will facilitate the student beginning the clinical study of certain types of cases in the department of Medicine in the third trimester of the Fourth Year instead of the beginning of the Fifth Year.
3. *Radiology*: A reduction of the number of didactic lectures from 40 to 30 hours.
4. *Obstetrics*: In this subject the most important changes have been introduced. Last year the didactic course on normal obstetrics was moved back into the Fourth Year and the time-table so planned that all didactic work would be completed by the end of the Fifth Year. At the same time arrangements were made with St. Michael's and the Western Hospitals whereby each Fifth Year student will have five weeks' intensive practical training in one of these hospitals. During this period he will either live in hospital or be on call continuously. He will be excused from all other work except afternoon lectures. In the Sixth Year he will again have five weeks' practical training in Obstetrics and Gynaecology, during part of which time he will live in the General Hospital and take part in the routine work as in general practice. This very great increase in the practical training in

Obstetrics should remove what has hitherto been a serious weakness in our course.

5. *Physical Therapy*: The increasing popularity of various empirical forms of Physiotherapy led the Committee to recommend greater attention to the teaching of this subject. Under the direction of Dr. W. J. Gardiner in the Department of Therapeutics, the teaching of Physiotherapy has been established on a scientific basis and each student is given an opportunity to acquire both theoretical and practical training in the essentials.

The work of the Committee on Curriculum has proven so valuable that the Faculty decided to continue it indefinitely with the one idea that it might investigate the schedule for each year as a unit, in contrast with the former approach from the departmental standpoint, and also that it might define along broad lines the objectives to be kept in view in the basic medical sciences and the clinical divisions of the course as a whole.

The summer courses for volunteer students from the Sixth Year was continued in Surgery and Obstetrics and again proved very successful. These students were distributed among the various services as externs and received a practical training very similar to that of a hospital intern. When the trimester comes in the regular term, during which they should be studying the subject covered during the summer, special appointments will be given them in work in which they feel weak or in which they are specially interested. Thus, two will have appointments as externs at the Hospital for Sick Children, one at the Emergency Department of the General Hospital, one in the Urological Department, and one on the cancer wards.

Accounts of the many important researches at present being conducted in this Faculty will be found in the reports of the various departments. Some of these are of the utmost importance and indicate that this University holds a strong position among the great centres of learning.

The outstanding medical contribution of the year came in response to the challenge of the epidemic of infantile paralysis which swept through Toronto and Ontario last autumn. The

whole staff of the Hospital for Sick Children rose to this emergency and in conjunction with the Departments of Health of the province and the city did excellent work in the diagnosis and treatment of the disease. The size of the epidemic made it possible to observe in large numbers of cases the effect of convalescent serum. The consensus of opinion was that it was of no value. The suggestion, supported by experimental evidence on monkeys, that spraying the olfactory mucous membrane with zinc sulphate solution would prevent infection with the virus of the disease was tested out in a mass experiment on 5,000 children. A study of the results showed that the method as carried out was of no value.

A feature of the epidemic was the surprising number of adults that were affected. This presented an emergency at the General Hospital which was ably handled by the Medical Staff.

In both the children and the adults a very high percentage showed involvement of the muscles of respiration, and to meet the situation the mechanical department at the Children's Hospital supplied large numbers of Drinker respirators which proved of great value to both children and adults.

The postgraduate courses on manipulative therapy, cardiovascular diseases and fractures, held in the latter part of September, were well attended and successfully carried out. This year the courses will be on metabolic and endocrine disorders and on cancer. These short courses of one week of intensive study of special branches of Medicine and Surgery are proving very attractive to the graduates of both this School and others and will be continued as a part of the regular University work.

This year the Donald C. Balfour Lecture was delivered on Lister Day by Mr. Gordon-Taylor of Middlesex Hospital in London, England. His subject was "Gastric Haemorrhage". Mr. Gordon-Taylor made the journey from England specially to give this lecture and so brought to fruition the founder's hope that in this lectureship our students might, from time to time, have an opportunity to hear distinguished surgical teachers from abroad.

The practice of inviting the Charles Mickle Fellow to deliver a lecture to the students and Faculty has proven very successful and has given us an opportunity to meet intimately

the most distinguished practical research workers of their time. Last year we had a most interesting lecture from Dr. Donald D. Van Slyke on "Neutrality regulation of the Organism". This year the award has been made to Dr. George Hoyt Whipple of the University of Rochester for his work on pigment metabolism and regeneration of haemoglobin.

Well deserved honour has come this year to Professor C. H. Best, Head of the Department of Physiology, who was elected a Fellow of the Royal Society of England. Professor Duncan Graham was elected as a Fellow of the Royal Society of Canada. Dr. Gordon Murray of the Department of Surgery has been much honoured also in his appointment as an Hunterian Professor in the Royal College of Surgeons of England for his work on "Heparin".

I regret to have to record the death of a member of the Faculty, Dr. George R. Pirie, of Dr. George C. McIntyre, a former teacher in the Department of Surgery, and of Dr. E. A. Gray, the Medical Superintendent at the Toronto General Hospital.

Doctor Pirie was a distinguished member of the Medical Staff of the Hospital for Sick Children and an excellent teacher of Paediatrics. Dr. McIntyre was an exceedingly popular young surgeon whose retirement some years ago because of ill health was regretted by all. Doctor Gray was known to all interns and students and was a valued friend of the University.

#### MEDALS, PRIZES, FELLOWSHIPS, SCHOLARSHIPS AND BURSARIES

*Awarded by the Senate of the University  
Faculty of Medicine*

##### SIXTH YEAR

The Faculty Gold Medal.....	A. Goggio, B.A.
The Faculty Silver Medal.....	E. B. Tovee
The Faculty Silver Medal.....	M. E. Borsook
The Ellen Mickle Fellowship.....	A. Goggio, B.A.
The Chappell Prize in Clinical Medicine .....	A. Goggio, B.A.
The William John Hendry Memorial Scholarship in Obstetrics and Gynaecology.....	W. E. Apted
The Ontario Medical Association Prize in Preventive Medicine	E. B. Tovee
The David Dunlap Memorial Scholarship.....	A. A. K. Bochner

##### UNDERGRADUATE

The David Dunlap Memorial Scholarships :	
(a) Fifth Year.....	D. H. Copp, B.A.

- (b) Third Year.....G. R. Walker and  
B. Winter (Aeq.)  
The Ronald S. Saddington Medal in Pathology.....T. A. Fraser, M.A.  
The James H. Richardson Research Fellowship in Anatomy  
F. Richardson, M.B., B.S. London  
The Toronto Women's League of the United Synagogue...H. H. Fireman

#### GRADUATE

- The Reeve Prize.....C. G. Smith, M.Sc. West., B.A., M.D., Ph.D. Tor.  
The Starr Gold Medal.....M. O. Klotz, M.D.  
The Alexander McPhedran Research Fellowship in Clinical Medicine  
J. L. A. Fowler, M.D.  
The Perry Goldsmith Prize in Oto-laryngology...G. W. McGregor, M.B.  
The J. J. Mackenzie Fellowship in Pathology and Bacteriology  
C. L. Burke, B.A., M.D.  
The Lister Prize in Surgery..J. R. F. Mills, M.D., and  
F. B. Plewes, M.A., M.D., F.R.C.S. (Edin.),  
Aeq.

### REGISTRATION OF STUDENTS IN THE FACULTY OF MEDICINE SESSION 1938-1939

	<i>Men</i>	<i>Women</i>	<i>Total</i>
First Year.....	133	10	143
Second Year.....	110	8	118
Third Year.....	118	12	130
Fourth Year.....	128	9	137
Fifth Year.....	123	10	133
Sixth Year.....	127	11	138
D.P.H.....	18	0	18
D.R.....	3	0	3
D.Psych.....	7	1	8
B.S.c.(Med.).....	4	0	4
Occasionals.....	2	0	2
Post Graduate.....	23	1	24

### DEPARTMENT OF ANATOMY

*(Under the direction of Professor J. C. B. Grant)*

It may be of interest to note the number and variety of students working in the Department of Anatomy during the session 1937-1938.

*Medical:* Second Year (126), Third Year (130).

*Biological and Medical Sciences:* Third Year (13), Fourth Year (16).

*Dental:* Second Year (48).

*Courses in Elementary Anatomy were given to:* Graduate Nurses from School of Nursing (25), First Year Occupational Therapy (24), First Year Physiotherapy (22), Second Year Physiotherapy (15), Margaret Eaton School, Juniors (34), Margaret Eaton School, Seniors (18), Second Year Arts (7).

*A course in Neurology:* Psychology students, Third Year (14).  
*Lectures on the Orbit:* Students of the College of Optometry (22).

In addition to these a number of undergraduate and of graduate students worked in various fields.

The courses in Elementary Anatomy were given by Dr. R. K. George and Miss McMurrich; the course for the Optometrists and the course to the Psychology students by Dr. H. A. Cates; special courses in Histology were conducted by Dr. A. W. Ham.

It has almost become a function of this department actively to encourage those who propose to sit the primary examination of the Royal College of Physicians and Surgeons of Canada. To this end junior demonstrators of Anatomy are recruited almost entirely from those who propose to sit this examination; and during the month of September a refresher course is offered conjointly by the Departments of Physiology and Anatomy for candidates intending to sit this examination. Last year thirty members were enrolled in this class, conducted by Dr. J. C. Watt, and of these 18 passed, 7 failed, and 5 did not write the examination.

For the second year course in Histology, Dr. Ham prepared a complete set of mimeographed notes of his lectures and distributed them to the students. An important time-table change was made whereby the Histology lecture immediately precedes the laboratory period in this subject. This brings Histology into line with 2nd year Anatomy and with Neurology. At present Dr. Ham is engaged in writing a text-book in Histology for his students.

A certain economy in time was made by withdrawing the laboratory course in Embryology and giving a lecture-demonstration course of one hour a week throughout the session.

C. G. Smith, B.A., M.Sc. (West), M.D., Ph.D., whose chief interest is in the neurological aspects of anatomy, was appointed lecturer in Anatomy. Since his appointment, Dr. Smith has been awarded the Reeve prize in Medicine for his published work on the neocortex, olfactory bulbs and olfactory mucosa. Also, he received a certificate of merit, at the Ontario Medical Association meetings in May, 1938, for his demonstration of the effect of zinc sulphate on the olfactory mucosa.

The head of the department prepared a text-book—A Method of Anatomy—which was published during the session. It is hoped that this will assist the students to a better understanding and appreciation of anatomy, and that it will simplify their work.

Mr. H. E. Le Masurier, working with the domestic fowl, has, with the assistance of the Department of Agriculture, conducted extensive experiments both at home and in the department. These deal with the problems of growth under various dietetic conditions. His findings have created considerable interest,

## DEPARTMENT OF BIOCHEMISTRY

(*Under the direction of Professor H. Wasteneys*)

I have the honour to submit the following report on the Department of Biochemistry for the year 1937-38.

The staff of the department remained as it was during 1936-37 with one exception, namely that Miss Edith Batho was replaced as junior fellow by Miss Elizabeth Macpherson, B.A. Three former members of the staff returned to the department temporarily during the summer. Dr. Desmond Beall, who after his return was engaged in research in the department under a grant from the Banting Foundation, was awarded a Beit Memorial Fellowship and is now engaged in research at the Post Graduate Medical School in London, England; Dr. Saul Cohen, after holding an 1851 Exhibition Research Scholarship, returned in the fall and accepted a research position on the staff of Ohio State University; while Dr. Anthony Brown returned from the London School of Tropical Medicine and accepted a position in the Entomological Branch of the Department of Agriculture.

The total number of students registered in the department during the session 1937-38 was 458. This number was made up of 285 Medical students, 27 students in the B. & M. course, 6 in the P. & B. course, 7 students in Chemistry, 5 from the Department of Biology, 30 from Household Economics, 23 from Household Science, 6 in the General Course, 38 from Dentistry, and 31 graduates. Of the graduate students, 24 were candidates for the Ph.D. degree, 2 for the M.A., and 5

were registered as graduate students on probation. Fifteen students were taking biochemistry as a minor for degrees in other departments, and 8 students have taken work as a major or a minor in Zymology.

We have now completed the second year of the new course in comparative and general biochemistry for students in the Biology and Biological and Medical Sciences courses. The students in the latter course were, for the first time, those taking the new B. & M. course. The total number of students taking this course was 23 and this relatively small number made it possible to try the experiment of replacing a portion of the laboratory work by demonstrations. The experiment proved to be most successful. The student's time was economized and it was possible to demonstrate procedures which it is impracticable for the students themselves to carry out in the ordinary laboratory course. The new curriculum for B. & M. students, while it has increased the total length of the combined course to 8 years, appears to be justified, so far as one may judge from the results of this year. The students exhibited a deeper interest in the fundamentals of biochemistry, and although more advanced papers were set than in previous years the answers given were most satisfactory.

The Medical students, for the first time, took biochemistry in the second half of their second year in accordance with the new curriculum. The change from the previous arrangement in which biochemistry was given entirely in the third year was made in order to facilitate the correlation of the teaching in biochemistry and organic chemistry, and also in order that a considerable portion of the biochemistry course might be completed before commencing work in physiology. It is too soon to express an opinion on the results of this change, but it appears to have been of benefit if only because it has necessitated the elimination of other students from the group taking this course of lectures. The consequent decrease in the number of students has increased the effectiveness with which the subject may be presented.

Because of the change in the curriculum it has been found necessary to provide a separate course for the students in Household Science and Household Economics. This will come into effect next year and it is believed that these students too

will be benefited by the fact that the group is smaller and that the presentation of the subject may be adapted to their particular requirements.

The number of lectures given in the course for students of the Faculty of Dentistry has been nearly doubled at the request of that Faculty. This obviously enables the subject to be dealt with much more comprehensively and we believe will benefit the student in Dentistry because a knowledge of biochemistry is fundamental to a proper understanding of oral physiology.

The staff of the department carried on their researches throughout the session and during the summer vacation. While these researches have been fully described in a separate report to the President, the following brief review may be of interest.

The group of research students working with Dr. Marrian have continued their study of the sex hormones. In addition they have been investigating the nature of similar chemical compounds present in the urine of women suffering from virilism of adrenal origin, and have been able to throw light on the metabolism of these compounds in the body and upon the aetiology of this type of virilism. They have also been able to isolate and identify several new crystalline substances from the urine of pregnant mares, and they are still engaged in isolating and identifying steroids from a concentrate representing 25,000 gallons of pregnant-mares' urine, which has been kindly supplied by a firm of Pharmaceutical Chemists in the United States. They have been able to extract and purify the enzyme  $\beta$ -glucuronidase from the spleen and other tissues. This enzyme plays an important part in sex hormone metabolism, and its isolation has enabled results to be obtained which are of considerable significance in the whole problem of the detoxifying mechanisms of the animal body. In order that the organic micro-analysis essential for this work may be performed with expedition, a special laboratory has been equipped in the department with the necessary apparatus for the micro-determination of the elements in organic compounds. The establishment of this laboratory, which is in charge of Miss Dorothy Skill, has resulted in very considerable saving in time and expense to the department. Another group of students has been working under Professor Wynne on the general sub-

ject of enzyme action, but particularly the synthetic action of enzymes and the factors affecting their formation in micro-organisms. Mr. Crocker and Dr. Hamilton are continuing their investigation on digestion in the animal organism. Dr. H. B. Collier, Professor of Biochemistry at West China Union University and now on leave of absence, has been engaged in the study of the factors determining the rate of synthesis of protein-like substances by the enzyme papain.

## DEPARTMENT OF HISTORY OF MEDICINE

(*Under the direction of Professor Jabez H. Elliott*)

The course of lectures laid down in the curriculum was given. The attendance at lectures and the interest evinced in the subject was most gratifying. Further additions have been made to the collection of lantern slides used to illustrate these lectures. I attended the annual meeting of the American Association of the History of Medicine at Atlantic City, May, 1938, took part in the discussions and on invitation contributed a paper on *The First English Dispensary, the Men Behind it*, illustrated with lantern slides. Leave of absence was requested to attend the XI International Congress on the History of Medicine in Jugoslavia, September 1-13, as the representative of the University of Toronto. I have also been requested as Member of Council to represent the American Association of the History of Medicine.

The material reported last year supplied to the Mountain Sanatorium for an exhibit of *The History of Tuberculosis* and exhibited at the annual meeting of the Canadian Medical Association was awarded a diploma for its excellence of presentation.

Four publications have been issued.

- (a) *The Evolution of Dispensary Control of Tuberculosis Historical Aspects.*
- (b) *William Tempest, M.B., L.M.B., U.C. 1819-1871*  
*William Fairbanks Tempest, 1846-1866.*
- (c) *Sixteenth Century Books in the Academy of Medicine, Toronto.*

(d) *Medical Faculty of the University of Toronto, its Early History and Development.*

May I express the hope that the time is not far distant when we may have a special room set apart in the Library for History of Medicine, where small groups of students may have an opportunity to become acquainted with the important texts in Medicine and receive seminars in bibliography and reference books.

## DEPARTMENT OF HYGIENE AND PREVENTIVE MEDICINE

*(Under the direction of Professor J. G. FitzGerald)*

The enrolment of graduate students in the course leading to the Diploma in Public Health for the session 1937-38 numbered eighteen. The following provinces were represented: Nova Scotia, New Brunswick, Quebec, Manitoba, Alberta, British Columbia, Ontario. The registration included one candidate from India and two from China. Twelve students were on fellowship; ten Rockefeller Foundation, and two Connaught Laboratories. These figures indicate the important part the School of Hygiene plays in the training of students from Canada and foreign countries for a career in Public Health and Preventive Medicine.

The method of instruction, adopted two years ago, in preventive medicine to students of the fifth year in medicine has proven satisfactory. The large class of 136 students is divided into six sections each in charge of an instructor. Those taking charge of the tutorial groups are Dr. M. H. Brown, Dr. Frieda Fraser, Dr. Donald Fraser, Dr. R. Hare, Dr. D. L. MacLean, Dr. F. O. Wishart. This scheme not only allows of individual attention to the students but stimulates the members of each tutorial group to take an active part in the proceedings. The reading and discussion of current journals and of classical literature is fostered. The students are required to present allotted subjects to the members of the class. The emphasis has thus been successfully shifted; instead of being

a passive recipient of information, the student is encouraged to take an active part in the process of learning.

As in the past the success of the three weeks' field course, held in the spring and fall, has been in large measure dependent upon the generous and efficient co-operation of the members of the Department of Health, Ontario, and the Department of Public Health, Toronto. The magnitude of this undertaking and the indebtedness of the Department of Hygiene and Preventive Medicine may be gauged by the number of persons of these two Health Departments alone who take part in the instruction, namely, thirty-two.

The new laboratory courses in microbiology were offered by the department during the past year to students of the second year Pharmacy and to students of the second year Household Economics and Household Science. Although the burden of teaching has been greatly increased the stimulus to the department has quickened an interest in devising laboratory exercises suited to the needs of these students.

The total enrolment for the session has been as follows:

Graduate Students (18 Candidates for Diploma in Public Health) . . . . .	23
Faculty of Medicine, Fifth Year . . . . .	136
Faculty of Household Science, Second and Third Years . . . . .	31
Faculty of Arts, Second and Third Years . . . . .	63
College of Pharmacy, Second Year . . . . .	104
Physical Training, Fourth Year . . . . .	5
School of Nursing . . . . .	57

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The two Fellows in the department were Dr. Lassalle Laberge of the Ministry of Health, Quebec, and R. J. Wilson. The former attended certain of the classes for students in the course for the Diploma in Public Health and devoted his time mainly to a study of the organization for the control of tuberculosis in Ontario. He was able to see the work at first hand and he availed himself of the opportunity of travelling to many centres in Eastern Ontario in connection with his studies. R. J. Wilson continued his studies in staphylococcus, in which field of work he formerly held a grant from the Banting Foundation at the University of British Columbia.

The details of research carried out by members of the department, who are also members of the staff of the Connaught Laboratories, may be found in the report of the

Director of the Connaught Laboratories. Studies are being actively pursued in the following subjects— influenza virus, diphtheria, immuno-chemistry, pneumococcus, streptococcus, staphylococcus, salmonella, typhoid, pertussis, meningitis and pneumococcic meningitis, menigococcal and influenzal meningitis.

## DEPARTMENT OF MEDICAL JURISPRUDENCE

(*Under the direction of Dr. K. G. Gray and Professor W. L. Robinson*)

An attempt is made in these lectures to deal with some aspects of law in relation to medical practitioners and hospitals. Some time is devoted to the establishment and constitution of the College of Physicians and Surgeons of Ontario, with its licensing and disciplinary powers, and the rights and duties conferred by obtaining registration with the College. This involves some consideration of the relationship of the Canada Medical Act and the Ontario Medical Act.

It is thought worth while for the medical students to have some knowledge of the constitution of the various courts, both criminal and civil. Particular emphasis is placed upon the functions, procedure and practice of the coroners' court. The peculiar features of expert evidence, particularly evidence by doctors, is a part of these studies. The difference between a witness who gives evidence as to facts, and a witness who gives opinion evidence is explained, including such matters as the qualification of an expert witness, the fees, the subpoena, the medical report for counsel before trial, the use of original notes, and the circumstances under which professional secrecy is maintained.

Consideration is given to what might be called forensic psychiatry. In this field the student hears of the various institutions established for the care of the mentally ill person. Admission to these institutions is usually arranged by the family physician. The legal pitfalls pertaining to an improper admission to a mental hospital are well-known and merit some attention by any physician who is likely to be called upon to examine and certify mentally ill patients. In addition to certification of patients, forensic psychiatry embraces such matters

as the principles governing mental capacity in relation to criminal conduct, the making of wills, management of estates and contractual relationships.

The liability of doctors and hospitals in actions for negligence is another fertile field for medico-legal study. An attempt is made to outline the circumstances under which a public hospital or a doctor may become liable for injuries sustained by patients. Mention is made of the uncertain status of operations for sterilization. Legal issues arising out of a post-mortem examination are a further field of study.

On the pathological side very little change has been made in the course as originally given by the late Doctor M. M. Crawford. The necessity for a thorough examination of the remains in medico-legal cases is stressed, not so much to find the cause of death as to eliminate all other possible causes which may be used by the defence to cheat justice. Wounds of various types are discussed fully, more particularly as related to motor car injuries. Asphyxiation, drowning, gas poisoning, and abortions, etc., are some of the other subjects discussed.

## DEPARTMENT OF MEDICINE

*Under the direction of Professor Duncan Graham*

*Organization and Clinical Instruction.* In 1919 the late Sir John and Lady Eaton made a gift of twenty-five thousand dollars a year for twenty years to the Board of Governors of the University for the development of the Department of Medicine. The Eaton gift made possible the development of a plan of post-graduate training for junior clinicians and the study of a limited number of clinical problems by scientific methods. It was very gratifying therefore to learn last July through an announcement made by the Board of Governors that Lady Eaton and the T. Eaton Company would continue their benefaction for a further period of five years and for the department to know that the plan of development and the work now in progress will not be interrupted through lack of funds. If the continuance of this munificent gift may be taken as an endorsation by the donors of the work accomplished in the past nineteen years, it is a source of real encouragement to

members of the department in their efforts to further the scientific study of disease.

No essential changes have been made in the general plan of undergraduate instruction.

*Staff.* After two years' post graduate work in London, England, Dr. Wallace Graham has joined the staff of the department. Dr. Graham is a graduate, both in Dentistry and Medicine, of the University of Toronto. He will devote special attention to the effects of systemic diseases on the teeth and of primary disturbances of the teeth and gums on general health. The department is fortunate in having a member of its staff holding this dual qualification.

During the past year, Dr. F. C. Heal has been Fellow in Medicine and Resident Physician of the Toronto General Hospital. The Alexander McPhedran Research Fellow in Clinical Medicine has been Dr. R. C. Dickson. The head of the department was elected a Fellow of the Royal Society of Canada.

*Investigation.* During the past two years Dr. Cleghorn has been studying the functions of the sympathetic nervous system in adrenal insufficiency. It has been found that the functions of the sympathetic nervous system and the effect of pressor drugs are normal in adrenalectomized animals receiving adequate quantities of cortical extract. In adrenalectomized animals maintained on a high salt low potassium diet, the functions of the sympathetic nervous system appeared to be normal but the effect of pressor drugs showed marked qualitative differences. A report of this work is being published. Preliminary studies on the relation of surgical shock to adrenal insufficiency have been made. This work is being continued.

Drs. Cleghorn and Hyland, in association with Drs. Linell and Mills of the Division of Nueropathology, have published a most complete clinical and pathological study of a case of tumour of the pineal gland. As little is known of the function of the pineal gland, this report is an important contribution to our knowledge of the mechanism responsible for the production of the more important signs and symptoms present in this case.

Dr. Hyland, working in co-operation with the Department of Medical Research, has made definite progress in the study

of electroencephalograms from patients suffering from neurological conditions such as migraine and epilepsy.

The 1937 epidemic of poliomyelitis presented an opportunity for the study of a number of problems concerning the treatment of acute anterior poliomyelitis. Twenty-six patients in the pre-paralytic stage of the disease were treated with convalescent serum, but this treatment seemed to have no effect in preventing the development of paralysis or in modifying the course of the disease. In the treatment of respiratory paralysis different types of artificial respirators were tried. The Drinker respirator was by far the most effective during the acute phase of the illness and in cases where prolonged treatment was necessary. With a view to obtaining more accurate records of the progress of respiratory muscles showing paralysis, estimations of the vital capacity were made. Estimation of the vital capacity at intervals has proved to be a valuable aid for determining (1) the severity of the paralysis of the respiratory muscles at the onset; (2) the period of time each day a patient should be allowed out of the respirator after the acute phase of the disease is over; and (3) the length of time respiratory treatment should be continued. Unfortunately the method is not applicable in children suffering from poliomyelitis.

The results of repeated estimations of the vital capacity clearly show that prolonged immobilization of the spine and ribs definitely impede the recovery of the paralysed muscles. It has been shown that the institution of suitable remedial exercises at an appropriate time promotes the recovery of paralysed respiratory muscles and thereby lessens the tendency towards the development of deformities. The application of similar measures in the treatment of paralysed skeletal muscles would appear to be indicated.

Drs. Hyland, Gardiner, Heal, Oille and Solandt will publish shortly a report of the clinical findings and results in treatment of sixty-six adult cases of acute anterior poliomyelitis.

Drs. Cleaver and Maltby have published a report on the results of medical treatment in forty cases suffering from gastric ulcer. The average age of the patients was fifty-five years. After approximately five years thirty-three patients were free of symptoms, seven had symptoms suggestive of

gastric ulcer, but only three of the forty patients presented X-ray evidence of an active gastric ulcer.

In 1931, Dr. Farquharson and the head of the department reported the first cases of Simmonds' disease discovered on this continent. At a recent meeting Dr. Farquharson, in association with Drs. Belt and Duff of the Department of Pathology, reported the results of a clinical and pathological study of four cases of this rare disease. The clinical manifestations of Simmonds' disease are closely simulated by those found in anorexia nervosa. Many of the cases reported as Simmonds' disease are evidently cases of anorexia nervosa. Drs. Farquharson and Hyland will publish shortly a report calling attention to differences in the clinical and pathological findings in these two conditions.

The effect of different vitamin deficiencies is being investigated. Dr. Wallace Graham has determined the vitamin C content of the urine in a variety of diseases. Cases presenting evidence of vitamin C deficiency have been given liberal quantities of ascorbic acid and its effect on the clinical condition of the patient observed. Changes in the gums and teeth in such conditions as diabetes mellitus, arthritis and nephritis are being studied.

A list of publications is appended.

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## DEPARTMENT OF OBSTETRICS AND GYNAECOLOGY

*(Under the direction of Professor Wm. A. Scott)*

I have the honour to present the following report of the work of the Department of Obstetrics and Gynaecology for the academic year, 1937-1938.

During the last three years there have been some important changes in the curriculum as regards this department. The lectures now commence in the Fourth Year and the systematic didactic instruction is completed in the Fifth Year. During Sixth Year one lecture clinic a week is given to the whole class at which clinical problems are discussed. The practical training commences in the Fifth Year and commencing this fall this time will be increased to five weeks. This practical training is continued in the Sixth Year, and all students live

in the hospital for a short period of time, and are on constant call throughout their period of training. It is felt that the students are now having a more adequate opportunity for practical experience in obstetrics, and that the available material is more fully utilized. Material difficulties would appear to make it impossible to give the student training in the delivery of patients at home. Therefore every effort is being devoted to increasing their hospital experience.

With the added opportunity for training, the standard of examination has been raised. The Fifth Year examination is a comprehensive one and covers the student's theoretic knowledge. Sixth Year examination is both oral and written and is entirely practical in nature.

A summer course is carried on for six weeks for a limited number of students who have completed their Fifth Year, and is proving eminently satisfactory.

The possibility of a refresher course in obstetrics has been considered and the principal difficulty to arranging such a course lies in the fact that the time is necessarily limited and there is no assurance that any practical obstetrical abnormalities might be in hospital during that period. If this should be the case, such a course would consist of theoretic discussion and the only actual work to be seen might be normal deliveries. It is possible that a refresher course combined with some other department might be put on in the future.

Routine work in gynaecological pathology has been taken over by Professor Boyd, and Dr. Nelson Henderson is confining his pathological work to certain subjects in which he is particularly interested.

It is with regret that we announce the resignation of Dr. J. A. Kinnear, Associate in this department, who has served with great faithfulness and distinction over a period of 30 years. His services will be greatly missed.

Dr. J. R. McArthur returned in the fall from study abroad, and is assisting Dr. Cosbie in the radiological treatment of carcinoma of the genital tract in collaboration with the Institute of Radio-therapy.

Dr. M. C. Watson has continued his work in the study of endocrinology and has again published an interesting paper on that work.

## DEPARTMENT OF OPHTHALMOLOGY

(*Under the direction of Professor William H. Lowry*)

I have the honour to report on the activities of the Department of Ophthalmology during the last session.

Early in the session an effort was made to impress the students of the necessity of their being able to serve the public in the treatment of eye diseases and eye emergencies. Judging from the interest in their clinics and from the results of their examinations, I would say that we have succeeded in sending out this year a very good class of practitioners. I was pleased to see that a larger percentage of the students had ophthalmoscopes of their own and they were consequently much more skilled in their use.

The staff have worked in harmony and have been faithful in their teaching duties.

Dr. Morgan has had an opportunity in a patient to apply his method of corneal transplantation, and although it was not a suitable case for getting the best results, the transplant graft healed kindly and proved the soundness of his method.

Dr. MacDonald's department received and made studies of about one hundred pathological specimens sent from our own hospitals and the Provincial laboratories and shipped from various practitioners throughout Ontario, and from these the department has added to its museum collection. Dr. MacDonald read and published three papers:

"Retinal Circulation and changes in Metabolic Disease" published in the Transactions of the Ophthalmological Society of the United Kingdom.

"Etiology of Idiopathic Retinal Detachment", published in the transactions of the American Ophthalmological Society.

"Staphylococcus Toxoid in Recurrent Styes", published in the Canadian Medical Journal.

Doctors MacDonald, Macrae and Johnston prepared and exhibited in the recent Ontario Medical Association Meeting, a number of hand-painted illustrations of common diseases of the retina. These appear to have interested the general practitioners.

## DEPARTMENT OF OTO-LARYNGOLOGY

(*Under the direction of Professor P. G. Goldsmith*)

During the past academic year there have been little changes of note to report. During the year a conference was held with the special Committee on the Curriculum. I submitted a report as requested on the general objects of the teaching in the Department of Oto-Laryngology, and a detailed account of the instruction the student receives.

Oto-Laryngology has not always been a compulsory subject in Medical School examinations. Owing to the general progress of medical science and the importance of the refinements of medical and surgical investigations, added value has been given to diseases of the ears, nose, and throat. In other departments of medicine and surgery similar special teaching is maintained, all tending to a more intensive study of the problems involved in the special organs concerned. These special departments are essential to the complete study of the patients, and while invaluable, have the danger of being too closely concerned with the symptoms and complaints dealing with this restricted field. These special departments are in charge of men who have had special post-graduate training in their respective fields. The success of these "specialists" both in teaching undergraduates and attending to the clinical practice of the hospital depends very largely on the thoroughness of their training in Medicine, Surgery, and Pathology.

The Department of Oto-Laryngology is singularly well situated in this regard. The staff has had a very thorough training and is very efficient. They have, especially in recent years, taken great interest in attending specialists' conventions, and the literature is very intensively studied. I should say the staff is soundly conservative, familiar with the new but untried methods of treatment, but not accepting them unless convinced by their own experience and that of sound men elsewhere, that they are best for the patient.

The teaching to undergraduate students in medicine has for its object the sending out to the public safe efficient doctors.

The Department of Oto-Laryngology, in order to take its place in securing for the public their rights and expectations, teach the medical student how to examine these special regions

and recognize the common diseases. In no way is it expected to make the student even a poor specialist. In the fifth year small groups of students have their knowledge of special anatomy reviewed, and are practiced in using ordinary instruments required in examining the ears, nose and throat. The next or final year is devoted to the study of diseased conditions. Here instruction is by ten didactic lectures, and clinics held in the Out Patient Department, on the common ailments occurring in general practice. The didactic lectures while too few in number are made very practical. In these lectures every effort is made to make the students familiar with the importance of accurate history taking, and the significance of leading symptoms. The subjects taught come under such headings as —epistaxis, nasal discharge, sore throat, hoarseness, complications of aural suppuration, pain and swelling about the ear, deafness, vertigo, and tinnitus.

An oral examination is held at the end of the final year. A student must show he is able to use his examining instruments intelligently. He must satisfy the examiner that he has sufficient knowledge to recognize the simple common ailments in general practice, and is sufficiently familiar with the ordinary complications and dangers of most ear, nose, and throat diseases to advise his patients what is the best course to pursue. No effort is made to test his knowledge of minute anatomy or special pathology.

There is a general tendency in the best Medical Schools to lessen the importance of the specialists and to restrict the time devoted to them in teaching hours. There can be little argument against this viewpoint. In our undergraduate teaching we have this ever in mind, and try to so arrange our instruction as to make the student a better all-round physician than a poor surgical specialist.

The teaching is now carried out in the Toronto General Hospital and the Hospital for Sick Children, where unusually excellent facilities are provided. I know of no better teaching arrangements than those preserved in the Toronto General Hospital. Next year St. Michael's Hospital will have for the first time, teaching in the final year of Oto-Laryngology. I have every hope the hospital will maintain the excellent

reputation it has achieved in teaching other branches of medicine and surgery.

## DEPARTMENT OF PAEDIATRICS

*(Under the direction of Professor Alan Brown)*

As in the past, the staff of the Department of Paediatrics, University of Toronto, has been actively engaged in studies on the prevention and cure of the various diseased conditions encountered during infancy and childhood.

Work in conjunction with the Connaught Laboratories has resulted in the perfection of whooping-cough vaccine which is now being made available to the physicians of Ontario. The results obtained with this vaccine have been so striking that the routine use of whooping-cough vaccine for the immunization of children against this dread disease is now advocated by practically all paediatricians in Ontario. During the year 1936, there were no less than 29 deaths in the Province of Ontario from whooping-cough. As the results with this vaccine indicate that 98 per cent. of the children inoculated are rendered immune, the universal use of this vaccine will be the means of saving the lives of many little children.

Also in conjunction with the Connaught Laboratories, a serum has been developed for the treatment of influenzal meningitis. Formerly this disease was invariably fatal. Through the use of this serum, in the last 50 cases at the Hospital for Sick Children, 12 recovered and are now perfectly normal. This means that these twelve children owe their lives to the use of this serum.

It is well known that certain infections such as measles and chickenpox are disseminated by the causative factors being carried through the air. With this in mind, extensive investigations are under way to study air-contamination and means for its control. In one of the hospital operating-rooms, installation of special ventilation and special ultraviolet lamps resulted in a reduction of the bacteria in the air much below that which has been previously obtained.

In recent years, it has been recognized that many forms of asthma are caused by minute particles of different materials in the air being inhaled by the patient. From studies conducted

in the Hospital for Sick Children, it has been found that in certain refractory cases the offending substance has been house dust. Accordingly, extracts have been made up from house dust which have been effectively used in the treatment of these distressing cases.

Studies have resulted in an improvement of our methods of treatment of bronchiectasis, pyelitis, nephritis and diabetes. A continuous study of these and other conditions is constantly necessary in order to evaluate the newer therapeutic measures which are being developed elsewhere as well as here. The study of heart disease in children is giving encouraging results of a most practical nature. It is now possible to determine fairly accurately the degree of activity of the disease and just how much physical exertion the child can safely undertake.

The mental health of the child is not being neglected in our studies. Extremely interesting results are being obtained in a study in co-operation with the Banting Institute of the electrical currents in the brain in different diseased conditions. These measurements are being made by means of the electro-encephalograph, which records and measures exceedingly minute electrical currents in different parts of the brain.

About the middle of August, 1937, it was evident that Toronto and Ontario were in the initial stages of an epidemic of anterior poliomyelitis. This dread disease rapidly spread through most of the province and to other parts of the Dominion. The staff and research facilities of the Department of Paediatrics were immediately placed at the disposal of the health authorities of the province and city, and took an active part in the prophylactic and curative measures which were instituted. In co-operation with the School of Hygiene, the Department of Health of the Province of Ontario, and the oto-laryngologists of all the city hospitals, the prophylactic value of the zinc-sulphate nasal spray was investigated. It involved the spraying of some 5,000 children and the careful comparison of the results obtained on this group and on a control group of children living in the same sections of the city and of the same age who had not received the spray. Unfortunately the results obtained indicate that this procedure as followed was not effective as a prophylactic measure. In the treatment of the disease, no evidence was found that con-

valescent human serum was of any benefit. In the course of the epidemic many emergency cases arose in which the unfortunate patients suffered from a paralysis of the respiratory muscles. To combat this phase of the disease no less than 27 mechanical respirators (iron lungs) were rapidly manufactured by the Hospital for Sick Children and used not only by the Department of Health of the Province but also were shipped to other parts of the Dominion.

There is no one factor in our daily lives which has a greater influence on health than proper nutrition. During the past year investigations have been undertaken on the need of vitamin A, vitamin C, iron and calcium. The utilization of iron and calcium in various Canadian foods has been studied. These investigations are giving information that is of importance not only in the prevention and cure of obvious nutritional deficiencies but when applied generally this knowledge will result in an increased resistance to disease, a higher level of health, and increased longevity.

## DEPARTMENT OF PATHOLOGICAL CHEMISTRY

*(Under the direction of Professor Andrew Hunter)*

In order to provide immediate accommodation for Dr. Hermann Fischer, the new Research Professor of Organic Chemistry, the Department has temporarily given up two of its rooms—the large research laboratory at the south-east angle and a smaller room on the north side, which has been in use as an animal room. The consequent loss of working space has been partly compensated by the addition of an extra laboratory bench in the north analytical laboratory, the conversion of the gas-analysis room into an animal room, and the construction, within the second research laboratory, of partitions forming an incubator room. It has also been found convenient to make some re-disposition of the remaining rooms.

By these arrangements the department loses valuable space. On the other hand it gains in the resulting close association with a group of workers in organic chemistry, and in access to Professor Fischer's valuable library, which has been installed in the corridor of the department.

Ever since this department was instituted, it has under-

taken the supervision of the clinical laboratory work (of a chemical nature) carried out by Fifth Year students at the Toronto General and St. Michael's Hospitals, and has utilized this supervision as a means of continuing through the fifth year the laboratory instruction first imparted in the fourth. It has been felt for some time that a similar use ought to be made of the facilities now available at the Western Hospital. This year, accordingly, an arrangement has been entered into, whereby Mr. J. Stewart Wilson, Chemist to the Western Hospital, has been appointed a demonstrator in this department. As such he will take the same charge of Fifth Year students working at the Western, as Dr. Boddington does at St. Michael's and Dr. Urquhart at the General. It is believed that this arrangement will be of great advantage to the students concerned.

The department suffered a distinct loss when Dr. F. H. Lawford, after only four months' service as Fellow, resigned his position to accept a post of great responsibility with the Standards Brands Co. During his brief tenure of a Fellowship, Dr. Lawford proved himself an earnest worker and a very competent teacher. His place has been taken by Dr. Woodward, who has already had considerable experience as an instructor and investigator.

The number of students registered in the department during 1937-38 was 277. This number includes 139 fourth year medical students, 134 fifth year medical students, and 4 graduate students (one of these a member of the staff). At the end of the year one candidate received the Ph.D. degree in Pathological Chemistry.

During the year the department has carried out 389 determinations of basal metabolic rate on 234 hospital patients. Of these patients 213 were surgical cases, 22 were obstetrical or gynaecological.

The research work of the department for the year has dealt with two general topics: renal function and enzymology. Drs. Nicholson, Urquhart and Selby, supported by a grant from the Banting Research Foundation, have continued on an extended scale their study of experimental nephrosis in animals. Using original methods of their own, as well as new procedures recently introduced by others, they have made

observations which add much to our knowledge of the effects of a specific type of renal injury. One phase of their study has already been completed, and another is already under way. The other investigations undertaken have been of a more academic nature, and are reported in detail in a separate report to the President.

The work completed during the year is described in six papers published or now in the press.

## DEPARTMENT OF PATHOLOGY AND BACTERIOLOGY

*(Under the direction of Professor William Boyd)*

This has been a year of change in the Department of Pathology and Bacteriology. Such change was inevitable with the appointment of a new head of the department, because no matter how brilliant a man's predecessor has been, no matter how efficiently the department has been functioning, it is inevitable that the arrival of a new personality should mean the introduction of new ideas, new ways of doing things. Some of these may be for the better; they may equally well be for the worse.

The principal change has been with regard to the time-table. Hitherto Pathology has been taught in the fourth and fifth years. The teaching has now been moved back to the third and fourth years. In the third year instruction is given in General Pathology, which is synonymous with the Principles of Pathology, such general subjects as degenerations, inflammation, the tissue changes resulting from the specific and non-specific infections, thrombosis and embolism, tumours, etc., being considered. These lectures are given by Dr. W. L. Robinson and Dr. G. Lyman Duff. At the same time the student is receiving his instruction in the course on Bacteriology, given by Dr. W. L. Holman. One result of this change is that when the student enters on his clinical work at the beginning of the fourth year he already has some idea of the tissue changes in inflamed organs, of the methods of spread of malignant tumours, and of why swelling and tenderness of the leg after an abdominal operation may be followed by fatal pulmonary embolism. The whole of Special Pathology, which

deals with the pathological changes in the individual organs and the effects which they produce, is now taught in the fourth year, so that the clinicians in the fifth year may presuppose on the part of the student a knowledge of at least the fundamental features in the pathology of the principal disease processes. These lectures are given by the head of the department.

Pathological instruction is continued into the fifth year along two lines. Each student attends ten autopsies and assists in the performance of two additional ones. Once a week half the class attends a conference of the staff of the Pathology Department at which are discussed autopsies of the week. The clinical history is first presented in brief; individual students are asked to suggest a diagnosis and to explain the symptoms on a pathological basis; finally the autopsy material, both gross and microscopic, is projected on the screen. This work is under the direction of Dr. Duff.

In the sixth year a Clinical-Pathological Conference is conducted by the Professor of Medicine and the Professor of Pathology. Here, with special emphasis on the clinical aspect, a case is discussed which has been studied on the wards and which has come to autopsy. The pathological material is again projected on the screen.

There is always great difficulty in presenting pathological material to a very large class. One way to meet this difficulty is to utilize methods of projection in every way possible. With this in view an extremely efficient microprojector has been purchased together with the best screen obtainable, and these have proved to be of very great value. An equally efficient projector for gross specimens is on order, and should be available for the coming year. A large number of pictures, many of them in colour, have been collected and mounted on a uniform size of card. These have proved extremely useful in illustrating lectures.

More emphasis is being laid on the study of gross pathology and less on the study of microscopic material, for the future practitioner of medicine is more concerned with gross than with microscopic appearance. For this reason the number of microscopic sections has been reduced to less than half, and the time thus made available has been devoted to the study of gross specimens.

An important asset of a medical school is a first class pathological museum. This department is fortunate in possessing a splendid collection of pathological specimens which have been gathered by Professor Oskar Klotz and before him by Professor J. J. Mackenzie. During the past year this collection has been re-arranged along somewhat novel lines. Three principles have governed this re-arrangement. First, the most natural and restful way of looking at books or specimens is in the inclined rather than the vertical position. Second, the description of the specimen should be so conveniently placed that the student does not have to move away in order to consult a catalogue. Third, the pathological museum should be a museum of disease rather than one merely of gross specimens; all aspects of a disease should be illustrated as far as possible. With these principles in mind the vertical museum stands with horizontal shelves are gradually being replaced by sloping shelves, five deep, arranged in the manner of a reading desk. The specimens are being transferred from rectangular museum jars to watch-glasses mounted on plate glass, which are admirably adapted for the sloping shelves. The shelves are provided with a deep pocket which contains a card 7x8 inches, of large enough size to carry a summary of the clinical history and the catalogue description of the specimen; the back of the card in many cases carries a microphotograph of the specimen. The wall above the shelving is provided with a board of soft wood to which is attached pictorial material illustrating the specimens on the shelves below. This material includes pictures of patients and specimens (for the most part in colour), X-ray pictures, temperature charts, electrocardiograms, charts of visual fields, statistical data, etc. The material relating to each organ or system is contained as before in separate rooms, and these rooms will be used in the future as they have been in the past for demonstrations, tutorials, and dry clinics for small groups.

Throughout the winter a series of weekly conferences have been held with the Department of Medicine, at which the clinical and pathological features of interesting and difficult cases are discussed in detail together with demonstration of gross and microscopic material on the screen. These graduate

conferences have aroused considerable interest and have proved stimulating for both departments. It is hoped that they may be continued during the coming year.

The system of indexing autopsy material has been completely revised and the size of the index has been considerably reduced. Although this has involved a large amount of work, especially on the part of Dr. G. Lyman Duff, the final result has been a great simplifying of the indexing of autopsies. It is hardly necessary to point out that the value of a mass of material is directly dependent on the simplicity and flexibility of the catalogue.

The department has again offered its facilities to the Canadian School of Embalming, and members of the staff have given a number of lectures and demonstrations. The course occupies one of the summer months.

The routine work of the division of surgical pathology under Dr. W. L. Robinson has been considerably augmented this last year by the taking over of the pathological work from the Department of Obstetrics and Gynaecology. A close contact with that department is still maintained much to the benefit of both.

The usefulness of the division has been further enhanced by the establishment, through the initiative of Dr. Robinson, of a sub-laboratory in the private pavilion of the General Hospital, close to the operating rooms. Here the surgical interne spends his mornings demonstrating the pathological lesions to the surgeons, as well as making his gross descriptions, drawings, etc., for the permanent records of the department. Following the morning's work the specimens are brought back to the main laboratory in the Banting Institute, where the microscopic sections are made and final reports completed.

The routine work of the division of neuropathology under Dr. Eric A. Linell has been facilitated during the past year by the promotion of Dr. M. I. Tom to the position of Lecturer, and by the appointment of Dr. J. C. Richardson as Fellow in Neuropathology. Both of these members of the division have done valuable work in the preparation of reports.

Dr. Margaret S. Thompson has, within the last few months, been placed under Dr. Linell's direct supervision, although she

is on the staff of the Department of Health. Her services are also proving of assistance in the preparation of reports on neuro-psychiatric pathological material.

The department has been fortunate in having the services of four voluntary Fellows for varying periods of time, Drs. M. R. Shaver, M. G. Whillans and J. G. McInnis on the autopsy service, and Dr. J. D. Balfour in bacteriology. During the summer months fifteen fifth year students are working in the department, nine at autopsies, three at surgical pathology, two in the museum, and one at neuropathology.

Under no circumstances is it easy for a new man to take over the direction of a large department. This is particularly difficult when one's predecessor was of a man of such outstanding ability and so forceful a personality as in the case of the late Professor Oskar Klotz. My task has been immeasurably lightened not only by the loyal co-operation of the entire staff but also by the friendliness with which I have been received.

## DEPARTMENT OF PHARMACOLOGY

*(Under the direction of Professor V. E. Henderson)*

The teaching in the department this year has been very satisfactory. Dr. D. D. Bonnycastle, a new Fellow, has done his work very satisfactorily; and Dr. H. V. Rice, having already had one year's experience, has proved an excellent member of the staff, much liked by students, and his instruction has been of a very high order. The teaching strength of the department this year has been high. Owing to the extra work in Pathology this year, due to the change in the curriculum, the students have been overworked and have, as in the past few years, been lacking in curiosity and in a desire to acquire information by their own efforts.

The research in the department has proceeded satisfactorily. Dr. Bonnycastle continued the work on adrenalin begun by Prof. Lucas last year, and the material is now ready for press. He has also begun a study of spinal anaesthesia, intending to settle the dispute in regard to the danger of direct

poisoning of the respiratory centre by a local anaesthetic rather than a poisoning of the phrenic roots. This study has also made good progress.

Dr. Rice has continued some studies begun last year on the reflexes controlling respiration and the effects of drugs on the respiratory mechanism. A good deal of very excellent material has been obtained and a preliminary communication was presented before the American Society for Pharmacology and Experimental Therapeutics in April. A series of papers dealing with this work is in the course of preparation.

Dr. Lucas has made a study of the oral absorption of bismuth, taking a new bismuth compound, Bisiodide, in order to obtain a thorough insight into the literature not only of the oral but of the intramuscular use of bismuth in the treatment of syphilis. His work was not only on animals, but owing to the co-operation of Drs. A. McKay, W. B. Edmonds and E. B. Hardy he was able to follow the excretion in a series of clinical cases. The study has been of value not only in giving this department a thorough insight into methods and the literature, but also as a means of informing some members of the clinical staff of the problem and its literature. A paper dealing with this study has already been published.

Owing to the kindness of the Ohio Chemical Company, the department was provided with specimens of monochlor and dichlor cyclopropane. Both these are liquids, the boiling points approximating ether and chloroform respectively. Unfortunately these substances proved to be quite unstable in the animal body giving rise to marked lung lesions, and are of no value as anaesthetic agents. This study enabled the head of the department to complete an investigation of the more obvious possibilities of improving cyclopropane and led to the presentation before the Royal Society of a paper reviewing the historical progress of our knowledge of chemical substances having anaesthetic actions. It showed the disadvantages of the various anaesthetic reagents at present available and enabled certain deductions as to the possible physical and chemical characteristics of substances which would prove suitable anaesthetics. Papers dealing with these two topics are in press.

## PUBLICATIONS BY THE DEPARTMENT OF PHARMACOLOGY, 1937-1938

- Drugs Affecting Parasympathetic Nerves—V. E. Henderson and M. H. Roepke. *Physiol. Reviews.* 17, 373, 1937.  
Anaesthesia with Cyclopropane Derivatives—V. E. Henderson and S. F. MacDonald. *J. Pharm. Exp. Thera.* 61, 182, 1937.  
The Administration of Bismuth—G. H. W. Lucas. *Can. Med. Assoc. J.* 38, 553, 1938.

## DEPARTMENT OF PHYSIOLOGY

(*Under the direction of Professor C. H. Best*)

The various teaching courses proceeded in much the same manner as last year. New plans for the teaching of the practical work in Third Year Medicine have been made so that the trimester system, to be introduced next year, can be utilized to the greatest advantage.

The researches carried on under the general direction of the head of the department were those of Mr. Louis Jaques on heparin and blood clotting, and those of Mr. James Campbell on fat and carbohydrate metabolism.

Mr. Jaques has continued his researches on the purification and properties of fibrinogen and thrombin and the physiology of heparin. Promising results have been obtained in the purification of these proteins. He has also confirmed and extended his previous findings on the nature of the fibrinogen-fibrin reaction and has determined the solubility of fibrin.

With regard to the physiology of heparin the reaction of protamine with the anticoagulant has been studied. Chargaff's finding that protamine neutralizes the action of heparin has been confirmed and the phenomenon extended to other basic proteins, some of which have been found to have the same action. The reaction has been studied in vitro and characterized as a simple salt formation. On the basis of this work, a quantitative test for heparin has been devised. In collaboration with Dr. Waters, this has been applied to the blood of dogs in anaphylactic and peptone shock. The incoagulability of the blood in these conditions has been shown to be due to heparin or a closely related substance released by the liver during the shock. These findings provide further evidence that heparin is a physiological substance. The studies on the

relation between heparin dosage and effect on clotting time have been completed.

The investigation of the relation of the anterior pituitary gland to fat metabolism has been continued by Mr. Campbell. During the visit of Dr. I. A. Mirsky to Toronto last June, attempts were made to find the immediate effects of adrenalectomy on the ketonaemia produced in rabbits by the injection of anterior pituitary extracts. This study is as yet incomplete.

In co-operation with Miss J. H. Ridout, it has been found that a fasting ketosis occurs in rats whose livers have been made fatty by high-fat low-choline diets, but this does not occur in normal rats. An "adaptation" to this ketosis occurs, but by the injection of anterior pituitary extract a greatly increased ketonuria is produced to which the animals may again become adapted. There is no constant relationship between the ketonuria and the level of liver fat. The ketonuria produced by anterior pituitary extract during fasting is greatly in excess of the fasting ketonuria after high-fat low-choline diets although the level of liver fat may be the same in both cases.

The "diabetogenic" action of anterior pituitary extract on normal dogs has been studied. In several animals the "diabetogenic effect" described by Houssay and his collaborators has been produced. In one a slight apparently permanent diabetes was produced. In another an intense diabetes was produced which persisted after discontinuing the injections. Subsequent findings strongly indicate that the diabetes has been produced by a degeneration of the islets of Langerhans of the pancreas.

Tests whereby the various physiological activities of anterior pituitary extracts may be assayed have been developed, and others are in the process of development. A method of assaying the potency of anterior pituitary extracts in increasing liver fat has already been described.

Fractionation of anterior pituitary extracts has already thrown some light on the nature of the substance present in such extracts which increases liver fat.

Mr. Campbell has also been helping Dr. N. B. Taylor with certain experiments where anterior pituitary extracts have been used.

For the past year Dr. R. E. Haist and Miss L. E. M. Roddy have been engaged in research under Professor N. B. Taylor's direction. Research assistance was given by Dr. T. H. Clarke of London, Ontario, who spent from September 1st to January 1st in the laboratory. His time was devoted mainly to experimental work on intestinal obstruction. Problems connected with intestinal obstruction continue to interest Professor Taylor and his collaborators, and a fair proportion of the time available for experimental work has been given over to this research. Dr. Haist is carrying out another series of experiments to determine the relation, if any, of the general effects of intestinal obstruction to the level of the plasma potassium. Among other researches at present under way is a study by Dr. Haist of the behaviour and reactions of decorticated animals. Studies upon calcium metabolism are being continued. The action of parathyroid extract upon the serum calcium of nephrectomized animals has been investigated. It has been stated that such animals fail to show the usual effects of the parathyroid hormone. No substantiation for the claim was obtained from this investigation. The effects of parathyroid extract and of viosterol have also been studied in puppies in which rickets had been induced by the administration of beryllium carbonate; animals in which the rickets is well marked are resistant to the action of the hormone, and also, but to a less extent, to viosterol. The relationship of parathyroid function to the action of prolactin upon the crop glands of pigeons is under study. Some interesting and suggestive observations have already been made. The pathogenesis of gastric and duodenal ulcer is a question upon which some light may be thrown from the experimental side. With this end in view, the actions of colchicine and cinchophen upon the gastric mucosa have been under investigation. Chronic ulcers in the pyloric region have been produced in a large proportion of dogs treated parenterally with the latter drug.

Professor Taylor, as co-author with the head of the department, has just published "The Living Body", a junior text in physiology requested by Messrs. Holt and Company for use in American colleges.

In the department of physiology the section in biophysics, under the direction of Dr. D. Y. Solandt, has carried out

physiological research along a variety of lines. Mr. J. W. Scott has been working on the so-called reaction of degeneration in denervated muscle. A method of measuring the time constant of accommodation in human nerve, using linearly rising exciting currents, has been perfected, thereby greatly simplifying the clinical measurement of this factor. Work started in the previous year on the excitation of single muscle fibres and its relation to neural connections has been carried further. Dr. E. H. Botterell and Dr. Solandt have collaborated on the measurement of the excitability constants in normal and in regenerated mammalian nerve. Through Dr. Botterell and Dr. T. S. Perrett this section has co-operated with the department of surgery and the section of urology in certain clinical investigations. Mr. F. L. Robinson has worked with the section in biophysics on the construction of a double cross-circulation pump of novel design. Mr. J. D. Brown has built an electronic device with several new features for the rapid measurement of hydrogen ion concentration by the glass electrode method. During the epidemic of anterior poliomyelitis in the summer and autumn of 1937 the section in biophysics collaborated with the department of paediatrics in the Hospital for Sick Children and the department of medical research in testing devices for the artificial respiration of patients with respiratory impairment. Collaboration of this section with the staff of the department of physiological hygiene in a study of the effect of heparin on coronary thrombosis produced in dogs is outlined elsewhere.

Dr. E. T. Waters and Dr. I. A. Mirsky of Cincinnati joined in an investigation on the utilization of  $\beta$ -hydroxybutyric acid by the mammalian heart-lung preparation. Briefly, it was shown that there was no semblance of a fixed ratio between the amounts of carbohydrate and of  $\beta$ -hydroxybutyric acid used by the heart and lung; also that there appeared to be preferential utilization of carbohydrate.

Further investigations have been made by Dr. Waters and Mrs. J. P. Fletcher on the effect of fructose on the glucose tolerance curve. A number of other substances have been used instead of fructose; so far sorbitol is the only substance which gives an effect similar to fructose on the glucose tolerance curve. Sorbitol is even more potent than fructose.

Sorbitol appears to be absorbed from the intestinal tract only very slowly and this fact accounts, partly at least, for earlier reports that sorbitol cannot be utilized by the mammalian organism. It is now demonstrated that parenteral injection of a solution of this substance into a fasting rat leads to a rapid accumulation of glycogen in the liver, and at a considerably faster rate than in control animals receiving an equal quantity of glucose.

Dr. Waters, in collaboration with Dr. J. Markowitz, has conducted investigations on anaphylaxis in the dog. It has been shown that, contrary to general belief, the anaphylactic reaction can still be obtained in a sensitized dog under ether anaesthesia, even after complete removal of the liver.

Dr. Fidlar has collaborated with Dr. Waters in experiments which had to do with the relationship of the respiratory quotient to the blood sugar level and the response to sugar feeding. With Dr. McHenry, experiments were made in the hope of obtaining from the respiratory quotient some evidence of the effect of vitamin B<sub>1</sub> in the metabolic change of carbohydrate into fat. With Miss Ridout, experiments were carried out to determine the metabolic rates of groups of rats under various conditions. Observations were made with Dr. Haist on a hemidecorticate dog in the fasting state, and with Mr. Campbell on a fasting "pituitary diabetic" dog. Dr. Fidlar's co-operation with his various colleagues has been greatly appreciated by them and by the head of the department.

The head of the department gave the Nathan Hatfield Lecture at the College of Physicians and Surgeons in Philadelphia on April 6th, and lectures in Cincinnati, Indianapolis and Dallas during the academic year. He is to give the Stephen Paget Memorial Lecture on June 9th in London, England.

During the past year the head of the department has acted as Chairman of the Scientific Advisory Committee on Nutrition to the Dominion Council of Health.

## DEPARTMENT OF PSYCHIATRY

(*Under the direction of Professor C. B. Farrar*)

I beg to report as follows concerning the Department of Psychiatry for the academic year 1937-1938.

The teaching programme for undergraduate medical students remains the same as during the past few years; but the number of groups requiring instruction in psychiatry and mental hygiene has been gradually enlarging. During the past year fourteen separate groups were receiving such instruction, including—medical undergraduate, 4 groups, medical graduate, 2 groups; law student undergraduate, 1 group; nurses undergraduate, 3 groups; nurses graduate, 2 groups; social service, 1 group; occupational therapy, 1 group.

Three graduate physicians completed the course leading to the Diploma in Psychiatry. The Faulkner medal was awarded to Dr. W. A. Cardwell.

Further work has been done in collaboration with the Department of Medical Research on the intermediate products of carbohydrate metabolism in certain acute psychoses; also on the biochemistry of hypoglycemic shock. These studies are still in progress. In the out-patient service, a study of factors in the psychoneuroses is being conducted.

Dr. J. D. Griffin was added to the staff as Fellow in Child Psychiatry.

## DEPARTMENT OF RADIOLOGY

(*Under the direction of Professor G. E. Richards*)

The work of the department has proceeded in a routine manner, and there is nothing of special significance to report, other than the change in the method of clinical teaching to the sixth year students in Surgery, described under that department.

## DEPARTMENT OF SURGERY

(*Under the direction of Professor W. E. Gallie*)

For a number of years it has been the hope of the Department of Surgery that the Surgical Divisions in the University

Hospitals might be established on such a basis that the teaching could be conducted in a similar way in each. This hope has now been realized and it has become possible to distribute the students of the fourth, fifth and sixth years to the Toronto General Hospital, St. Michael's Hospital and the Toronto Western Hospital, in proportion to the number of surgical beds. These hospitals have been organized so that a surgical division has charge of approximately eighty beds. Of such divisions the General Hospital has three, St. Michael's two and the Western Hospital one, and the students are distributed accordingly. The time-table is so arranged that every student has part of his surgical training in each of the three general hospitals.

During the fifth year each student has a course of thirty or more surgical clinics at the Hospital for Sick Children. No attempt is made to use this hospital for the teaching in the fourth and sixth years as it is felt that the work is too specialized.

The plan of providing a summer course for volunteers from the sixth year has been continued and has proved very successful. These students get a practical training in the routine of surgical practice such as can be obtained in no other way.

During the past few years the department has become dissatisfied with the system of annual examinations. These have consisted of a paper in which five or six questions of the "essay" type have been asked, and an oral examination in which the student is examined on his ability to examine a patient, make a diagnosis and to answer whatever questions may suggest themselves to the examiner. As a substitute for the usual paper we have tried out the so-called "comprehensive" type of examination in which a hundred or more questions are asked, each of which calls for an answer consisting of not more than a few words. This was first tried on the sixth year and it impressed us as an excellent method of examination. For the sixth year, however, it had the disadvantage that it left the student without practice for the written paper at the Dominion Council examination. We have accordingly reverted to the old type of examination in the final year, and introduced the "comprehensive" examination into the fourth and fifth years. The advantages of the method are several.

First, it is searching, in that it covers the whole subject; second, it is fair, as there are so many questions and the value in marks of any one is so small that disaster does not overwhelm the candidate if he happens to have misunderstood the question or to have overlooked studying the subject; and finally, it results in a set of answers that are easily read and that can be most accurately marked. Two examiners reading one of these papers will not vary 3 per cent. in the markings, whereas those same examiners will vary from 15 to 25 per cent. in marking the "essay" type of paper. Unfortunately for the examiners, the setting of the paper is a heavy task.

Following the policy adopted in other years, this department has tried to combine forces with other departments in teaching. In the past year the Department of Radiology has undertaken a course of clinical teaching in radiology as applied to surgery which has been most useful. The course takes the form of a conference between the final year students who are serving as surgical dressers and one of the instructors in the Department of Radiology. Their work consists of interpreting and reporting on the X-ray films of the students' own patients, and in making the various examinations under the fluoroscope.

For the assistance of students and instructors the department is proceeding this year with the development of a museum of applied anatomy. Dr. Ross McKenzie, who is attached to both the Department of Anatomy and the Department of Surgery, has been detailed to make dissections under the supervision of Professor Grant, which will provide permanent demonstration of those anatomical fields that are of interest to the surgeon. These will be of great value in both undergraduate and graduate teaching.

Through the courtesy of Sir Frederick Banting and the willing co-operation of the Superintendent and Board of Trustees of the General Hospital, an electro-encephalographic machine has been built and installed by the Department of Medical Research in a room adjacent to the neuro-surgical operating room. It is hoped that this apparatus will prove of value in the definite localization of brain tumours. Having the apparatus close to the operating room will make it possible for the surgeon to apply electrodes directly to the surface of the brain and so obtain records of the changes in bio-electric poten-

tials associated with tumours. Throughout the coming year an attempt will be made by the Departments of Medical Research, Medicine and Surgery to determine the clinical value of the apparatus.

Dr. Gordon Murray has continued throughout the year the study of the clinical applications of "heparin". An adequate supply of this expensive biological product has been provided through the generosity of Mr. J. Stanley McLean and the Connaught Laboratories. It is now definitely established that it is of great value in all operations on blood vessels and the heart, in preventing thrombosis, and the results in spontaneous venous thrombosis suggest that it is of value in preventing the extension of thrombus. The clinical experiment described last year to determine its value as a preventive of post-operative pulmonary embolism has been continued and is giving encouraging results.

Encouraged by the definite value of heparin in preventing thrombosis at the site of operations on blood vessels, Dr. Murray has enlarged the field of blood vessel suture to include free transplants of veins to replace gaps in arteries. This can be done with a high percentage of success in animals and its possibilities in wounds of great vessels and in tumours and aneurisms are highly interesting. He has also made some progress in an attempt to replace damaged heart valves.

In recognition of his work on heparin, Dr. Murray has been appointed Hunterian Professor in the Royal College of Surgeons of England and he will lecture on the subject in London early in the spring of 1939.

The study conducted by Dr. W. S. Keith on the use of free transplants of nerves that have undergone Wallerian degeneration has now reached a stage where it can be shown that following such operations there is a return of function in animals and that there is a down growth of axis cylinders through the degenerated graft. No opportunity has occurred in the general surgical service to make use of the principle involved but encouraging results have been reported by Dr. J. A. Sullivan in lesions of the facial nerves in temporal bone. Dr. Keith's work has been supervised by Dr. Linell of the Department of Pathology.

Dr. Stuart Gordon has continued his experimental studies

of the influence of refrigeration on free transplants of skin, fascia and bone. He is also engaged, in conjunction with the Department of Radiology, in studying the influence of X-ray, such as is used in the treatment of cancer, on skin grafts. These studies have important clinical bearings.

At St. Michael's Hospital, Dr. C. H. Watson and Dr. T. R. Sarjeant have conducted a study of the effect of the sterilamp in preventing the infection of wounds. This study is approaching completion.

Dr. D. R. Mitchell of the Department of Urology in collaboration with Dr. G. E. Hall, Dr. C. C. Lucas of the Department of Medical Research and Dr. Philip Greey of the Department of Bacteriology have conducted an exhaustive and successful study of the uses of mandelic acid and sulphanilamide in infection of the kidneys and bladder and urethra. For this work they were awarded a gold medal by the Ontario Medical Association.

In addition to the laboratory studies, several important clinical researches have been going on. Drs. R. I. Harris, Charles B. Parker and R. M. Janes have conducted an exhaustive follow up and analysis of the cases of biliary disease encountered in a period of four years. Dr. H. W. Wookey has undertaken a study of total oesophagectomy for cancer, which already yielded encouraging results. An original suggestion that the approach should be made from the right side and include ligation and sections of the vena azygos major has proved helpful. Dr. Botterell is engaged in a careful study of the sensation in a patient on whom Dr. K. G. McKenzie did a hemidecortication. Dr. Keith Welsh is continuing his studies of staphylococcus infection. Dr. R. I. Harris has studied the clinical results of the treatment of hernia by sclerosing fluids and has presented interesting experimental and autopsy material illustrating the effects. Dr. E. E. Shouldice has been studying the effect of the use of fascia lata in reconstructing and supporting the transverse metatarsal arch. Dr. R. R. Graham has continued his efforts to find a way to make total gastrectomy for cancer a safer operation. Dr. F. I. Lewis and the head of the department have interested themselves in an effort to induce union of ununited fractures of the neck of the femur by reduction of the displacement and the introduction

of a Smith-Peterson nail and a bone graft, without a major operation.

As in former years combined studies in the follow-up clinics have been conducted by this department in conjunction with the Department of Radiology. These include studies of oral carcinoma, carcinoma of the breast, malignancies of various kinds in the genito urinary tract and sarcoma, wherever it may occur. These combined studies have proved most interesting and are leading to a mass of accurate observations upon which authoritative opinions can be based.

The epidemic of infantile paralysis which occurred in Toronto in the autumn of 1937 gave the surgical staff at the Hospital for Sick Children a wonderful opportunity for service under pressure. Their particular contribution consisted of the development of a type of splint which could be easily applied and which would prevent, to a large degree, the deformations which so quickly follow the acute stage of the disease. In conjunction with the medical staff they organized and managed successfully a large special hospital devoted solely to poliomyelitis and altogether did an excellent piece of work.

In November, 1937, the head of the department delivered the "Founders" lecture in Vancouver to the North Pacific Surgical Society, and in April, 1938, delivered a Mayo Foundation lecture in Rochester, Minnesota.

The department regrets that with this year comes the retirement of Professor W. W. Jones, who for many years has been in charge of Urology at the Toronto General Hospital and in the University. Dr. Jones founded the science and art of Urology in this University and under his guidance it grew from a very small beginning to a great and most important department. On the occasion of his retirement he was honoured by the University with a promotion to the rank of Honorary Professor of Surgery. His duties as head of the Sub-department of Urology will be taken over by Professor Robin Pearse.

The post-graduate course on fractures conducted in the last week in September was again very successful and the popularity of these courses is such that we feel encouraged to continue these each autumn. In the first week of next October,

a course will be provided by the combined staffs of Surgery, Gynaecology, Pathology and Radiology on cancer.

The following papers have been published by the staff during the year:

- E. H. BOTTERELL: The Syndrome of the Superior Cerebellar Peduncle in the Monkey (with A. E. Walker). *Brain*, vol. IX, part 3, September, 1937.
- Frontal Lobe Tumours: A Clinical and Physiological Study (with H. H. Hyland). *C.M.A.J.* 37, 530-540, 1937.
- J. H. COUCH: First Aid Treatment of Fractures. *U. of T. Med. Journal*, March, 1938.
- G. S. FOULDS. Carcinoma of the Penis. *Brit. Jour. of Urology*, Dec., 1937.
- R. E. GABY. Lightening, Practitioner's Library. D. Appleton & Co. 1938.
- W. E. GALLIE. Skeletal Traction in the Treatment of Fractures and Dislocations of the Cervical Spine. *Annals of Surg.*, Oct., 1937.
- S. D. GORDON. Repair of Secondary Traumatic Defects in Lip Mucous Membrane. *C.M.A.J.*, vol. 38, 1938.
- R. R. GRAHAM. The Treatment of Duodenal Ulcer. *Surgery, Gynaecology & Obstetrics*, Feb., 1938.
- The Surgeon's Problem in Duodenal Ulcer. *Amer. Jour. of Surg.*, Apr., 1938.
- Technical Surgical Procedures in Gastric and Duodenal Disease. *Surgery, Gynaecology & Obstetrics*. Feb. 1938.
- R. I. HARRIS. The Importance of Early and Accurate Diagnosis in Osteogenic Sarcoma. *Surgery, Gynaecology & Obstetrics*, vol. 64, June, 1937.
- Experiences with Internal Fixation in Fresh Fractures of the Neck of the Femur. *Jour. Bone & Joint Surg.*, Jan., 1938.
- R. M. JANES. Indications for Pulmonary Lobectomy. *C.M.A.J.*, vol. 38, pages 538-544, 1938.
- A. B. LEMESURIER. The Operative Treatment of Cleft Palate. *Amer. Jour. of Surg.*, Feb., 1938.
- J. A. MACFARLANE and R. H. THOMAS. Fixed Skeletal Traction in the Treatment of Certain Fractures of the Wrist. *C.M.A.J.*, vol. 36, pages 10-12, 1937.
- K. G. MCKENZIE. Cranio-cerebral Injuries. *U. of T. Med. Jour.*, Jan. and Apr., 1938.
- H. W. WOKEY. Surgical Aspects of Oral Cancer. *C.M.A.J.*, vol. 36, No. 2, pages 148-152, Feb., 1937.
- D. E. ROBERTSON. Acute Haematogenous Osteomyelitis. *Jour. Bone and Joint Surg.*, vol. 20, No. 1, Jan., 1938.
- Fractures and Dislocations Involving the Elbow Joint in Children. *Amer. Jour. of Surg.*, vol. 39, No. 2, Feb., 1938.
- Medico-Legal Evidence. *Canadian Bar Review*, Mar., 1938.

## DEPARTMENT OF THERAPEUTICS

(Under the direction of Professor R. F. Farquharson)

There has been no appreciable change in the general plan of teaching described in previous reports.

Doctors I. Hilliard, A. M. Large and N. B. McGillivray, senior internes in Medicine at the Toronto General Hospital, were appointed Assistants in Therapeutics, in which capacity

they have given practical instruction in therapeutic procedures to small groups of students on the medical wards.

Doctor A. H. Squires was appointed Research Fellow in Therapeutics. He has been making a careful study of the effect of thyroid therapy in various endocrine and other conditions. This work will be continued during the coming year.

As formerly, research work in the Department of Therapeutics has been closely associated with similar activities in the Department of Medicine, particular attention being paid to certain aspects of the therapy of various haemopoietic and endocrine diseases.

The continued co-operation of Professor Duncan Graham and members of the staff of the Department of Medicine in the teaching of therapeutics as well as in other activities of the department is gratefully acknowledged.

#### SUB-DEPARTMENT OF ANAESTHESIA

The organization and teaching of the Sub-department of Anaesthesia, under the direction of Dr. H. J. Shields, has been continued as in former years. The sudden death of Dr. S. Douglas, who had given faithful service in the teaching of anaesthetics at St. Michael's Hospital, is reported with regret.

#### SUB-DEPARTMENT OF PHYSICAL THERAPY

Increased attention is being given in the Department of Physical Therapy, under the direction of Dr. W. J. Gardiner, to the practical instruction of students in physical therapy, including manipulation.

### DEPARTMENT OF MEDICAL RESEARCH (BANTING)

*Under the direction of Sir Frederick Banting*

For some years the Department of Medical Research has had the co-operation of members of the Mining group on the silicosis problem. During the past year the work has been continued as a general problem of the department.

On January 3, 1937, Mr. J. J. Denny and Dr. W. D. Robson, of the McIntyre Porcupine Mine, came to the Department of Medical Research and presented the results of their preliminary experiments by which they had shown (1)

that the addition of small quantities of metallic aluminum dust almost completely inhibited the solubility of siliceous material in a laboratory beaker, and that (2) rabbits dusted with quartz to which less than one per cent. metallic aluminum dust had been added showed practically no fibrosis, while control rabbits, which had been dusted with quartz alone, showed well-developed silicosis. The lungs and other organs of the animals of these experiments had been sent to Dr. D. A. Irwin, of this department, for pathological examination.

These preliminary experiments seemed to warrant a large scale investigation, and during the year Dr. Irwin and Mr. H. L. Collins, of this department, have carried on this work in collaboration with Mr. Denny and Dr. Robson.

It has now been shown that rabbits exposed for six months to an atmosphere containing quartz dust developed a silicosis which continued to progress after cessation of the dust exposure. Rabbits exposed to similar concentrations of quartz to which had been added 1 per cent. of metallic aluminum dust did not develop silicosis, after an exposure of a year. These animals showed no evidence of silicosis after being removed from the dust for a period of a year. Metallic aluminum has been found to effectively inactivate the quartz retained by the lung when inhaled as a mixture with quartz or when inhaled alone.

Considerable evidence has been obtained concerning the mechanism by which metallic aluminum inactivates quartz in the lung. The relation that exists between the solubility of quartz powder in vitro, the tissue response produced by the injection of quartz powders of varying solubility, the amount of aluminum necessary to inactivate quartz and the period for which aluminum will continue to inactivate quartz have been studied. The practical application of metallic aluminum to the prevention of silicosis in industry is now under way.

The following investigations have been carried out with the co-operation and the financial assistance of the Technical Silicosis Research Committee of the Ontario Mining Association:

Miss H. Williams and Dr. Irwin have completed a study showing that the silicates commonly found in silicotic lungs are

not leached to any appreciable extent by animal tissues up to periods of six months.

A study of the solubility of samples of quartz has been made by Miss Williams and Dr. Irwin. The samples were collected underground from the mining areas of Ontario by Mr. C. S. Gibson, of the above committee. Professor H. E. T. Haultain, of the Department of Mining Engineering, ground the quartz in a ball mill especially constructed to avoid contamination and fractionated the resulting powders by means of the infrasizer he has developed.

Mr. C. S. Gibson and Dr. Irwin have investigated the toxicity of the various types of quartz encountered in the mining industry of this province, and found them to be practically the same.

Dr. R. C. Sniffen and Dr. Irwin have demonstrated that certain silicates modify the action of quartz to increase or decrease its toxicity.

An X-ray diffraction pattern study of the crystalline siliceous materials present in silicotic lungs has been conducted by Dr. C. M. Jephcott (Division of Industrial Hygiene, Provincial Department of Health), Mr. W. M. Gray (Department of Physics), and Dr. Irwin.

A detailed study of a rare case of simple silicosis uncomplicated by infection or the presence of siliceous dust other than quartz has been made by Dr. A. R. Riddell and Dr. Jephcott (Division of Industrial Hygiene, Provincial Department of Health), and Dr. Irwin.

A study of the shadows produced by various dusts in X-ray films of the chest is being carried out by Dr. R. C. Sniffen and Dr. Irwin, with the co-operation of Professor G. E. Richards (Department of Radiology).

Mr. B. S. Leibel and Dr. G. E. Hall have developed a greatly modified form of thermostromühr, by means of which accurate registrations of blood flow in arteries and veins may be made. Using this stromühr, changes in blood flow in the coronary vessels as a result of nervous influences are being studied.

These workers are also studying the effects of autacoids, hormones and drugs upon the coronary blood flow, ventricular

output and total work of the heart in the isolated heart preparation, as well as in animals with denervated hearts.

Mr. G. W. Manning and Dr. Hall have conducted a series of experiments in which different branches of the coronary arteries have been ligated. The resulting myocardial changes have been studied at varying intervals so that specific time relationships are available in connection with the development of the progressive pathological changes. They have also found that sudden occlusion of a branch of the coronary artery in the unanaesthetized dog is usually fatal whereas in the anaesthetized animals no deaths occurred. The obvious influences of cardiac afferent nerves are thus being studied.

Mr. Manning has prepared many fine cleared specimens of human hearts as well as hearts from various types of animals. By these it has been possible to specifically note the differences in coronary artery distribution as well as the differences in anastomosis between the various branches.

Mr. Manning, Miss J. Lang and Mr. M. Allan have studied the changes in blood sugar, serum choline-esterase, blood sugar and heart-rate following the administration of parasympathetic drugs in normal animals and in animals in which this enzyme system has been inhibited by prostigmine, physostigmine or miotine.

Dr. Hall is studying the inotropic and chronotropic cardiac stimulation in animals deprived of their cardiac sympathetic control as well as in completely sympathectomized animals.

Dr. Hall is continuing the work on coronary artery and myocardial damage following the daily intravenous injection of acetylcholine in dogs. He has also produced atherosclerotic lesions in rats following long-continued daily subcutaneous injections of the same drug.

During the progress of the above experiment an inordinate number of spontaneous tumours have been found. These have been reported on by Dr. Hall and Dr. W. R. Franks, who are continuing to study the possible relationship of acetylcholine to the oestrogenic and carcinogenic substances.

Mr. D. W. Lougheed and Dr. Hall have been conducting a large series of experiments in an endeavour to apply the intravenous injection of oxygen and of oxygen and carbon dioxide to clinical patients. The use of intravenous oxygen in carbon

monoxide poisoning appears to be reasonable. The use of carbon dioxide and oxygen together with sodium bicarbonate may be of benefit in decreasing the alveolar carbon dioxide and increasing the oxygen of arterial blood.

Dr. S. Gordon and Dr. Hall are continuing the work on experimental nephritis. At the present time special attention is being paid to antigen-antibody relationship as produced by an injection of virulent streptococci in an animal already treated with many injections of a non-virulent culture of human haemolytic streptococci. The results are very encouraging.

Dr. Hall, Mr. D. Lloyd, Mr. J. Goodwin and Mr. B. Leibel have been engaged on the problem of the physiological significance of metrazol and insulin shock therapy in the treatment of schizophrenics. This is a division of a similar general problem undertaken by the Department in conjunction with the Departments of Psychiatry and Public Health, as well as the Committee on Mental Hygiene.

Mr. Leibel and Dr. Hall have studied the changes in the blood flow to and from the brain during experimentally produced insulin and metrazol shock.

Mr. J. Goodwin, Mr. D. Lloyd and Dr. Hall have studied the changes in the bio-electric potentials as recorded from the exposed area striata of the cortex during similarly produced shock. These potentials were recorded on the electroencephalogram which has been constructed in this Department by Mr. Goodwin.

Dr. Hall is conducting a series of experiments where groups of animals are subjected to repeated insulin and metrazol shocks for many weeks. Blood sugars, glucose tolerance tests, etc., are being carried out on these animals which will later be used by Goodwin, Lloyd and Hall in a comparative series of electroencephalographic studies of the effect of such chronic convulsions on the brain potential.

Mr. J. E. Goodwin and Dr. H. H. Hyland (of the Department of Medicine) are continuing their electroencephalographic studies of epileptic and other neurological cases from the Toronto General Hospital.

Mr. J. E. Goodwin and Dr. W. A. Hawke (of the Department of Paediatrics) are continuing their investigations of the

brain potential changes in "behaviour problem" children as well as in the different convulsive states. They are studying, also by electroencephalographic recordings, the effects of hyperventilation, etc., in normal and abnormal children.

Mr. Lloyd has been working on the various phases of ganglionic activity in the autonomic nervous system, with special reference to the following : (a) the excitability cycle of ganglion cells following activity; (b) the conduction of impulses by fibres which course directly through a ganglion; (c) retrograde trans-synaptic electrotonus and (d) the slow potential waves set up by preganglionic and antidromic stimulation. Experiments have been started on the action potentials of a smooth muscle system (*errectores pili*) excited by stimulation of the motor nerve supply. Recent developments from this work and by other workers in the field of nerve cell physiology have opened up many new questions for further experimental analysis.

Mr. L. Lawson and Mr. Lloyd have made a study of the potentials recorded from various parts of the cat's brain by means of the Horsley-Clarke instrument, both under normal conditions and under the influence of convulsive drugs.

In the biochemical division of the Department of Medical Research, Dr. C. C. Lucas has been studying the conditions necessary for the quantitative removal of cystine from protein hydrolysates, by a method which will not introduce any substances interfering with a subsequent separation of the remaining amino-acids. Mr. J. Beveridge and Dr. Lucas have been engaged in a study of the chemical make-up of human and other hairs. Mr. L. B. Macpherson has continued his work on the synthesis of phosphoric esters related to the phospholipids.

During the summer months of 1937, Dr. J. J. Rae, while holding the James Page Rutherford Fellowship, did further work on the phosphoric esters in normal human urine.

In collaboration with Dr. G. E. Hall and Dr. D. R. Mitchell (of the Department of Urology), Dr. Lucas has studied the physiological and biochemical properties of mandelic acid in connection with its use in the treatment of cystitis and pyelitis. Some hazards (such as acidosis and stone formation) have been found to be associated with the use of mandelic acid

as a urinary antiseptic. It has been possible to discover the clinical conditions in which the drug is contra-indicated; in other cases the drug is a valuable bacteriostatic agent of great value in controlling urinary infections. Miss J. M. Lang and Miss M. E. Wheatley gave valuable technical assistance by their careful analyses for urinary calcium and phosphorus, respectively.

An outgrowth of the above research was a collaborative study of the use of sulphanilamide in urology—Dr. D. R. Mitchell contributed the clinical data, Dr. Philip Greey (of the Department of Bacteriology) studied the effects of the drug upon pathogenic micro-organisms, both *in vivo* and *in vitro*, and Dr. C. C. Lucas, with the technical assistance of Miss Wheatley, conducted the biochemical control. The effect of the drug upon several species of animals, as well as upon healthy humans, has been also studied. Dr. Hall has collaborated in some of the animal experiments where surgical, physiological and pathological assistance was required. It is particularly gratifying to record that as a result of the cordial interdepartmental co-operation the research progressed most favourably and for an exhibit at the recent Ontario Medical Association Convention, showing the results of the above collaborative research, Drs. Mitchell, Greey and Lucas were awarded a gold medal. The work is being continued and the program has been expanded.

Dr. Lucas and Dr. Mitchell have also commenced a collaborative study of kidney and bladder stones.

Dr. Lucas has given some time to furthering the cancer research program: several batches of very pure sodium ferricyanide and a quantity of glucuronic acid were prepared in this laboratory.

The following work has been carried out under the direction of Dr. W. R. Franks:

The work on the synthesis of chemoantigens from non-immunizing compounds concerned in the pathogenesis of disease has been continued. As applied to carcinogenesis, immunization of mice with antigen formed by linking dibenzanthracene to casein gives evidence of yielding protection against the carcinogenic action of the dibenzanthracene. The

influence of such a procedure on spontaneous carcinogenesis in mice is under investigation.

The anthranyl and dibenzanthranyl isocyanates prepared by Dr. H. J. Creech in the above coupling to protein were identified by reaction with alcohols. The former substance and the  $\beta$  anthryl derivative are being used for possible cross-immunity against the carcinogens. Arrangements have been completed whereby the preparation of more suitable derivatives for anti-carcinogenic antigen formation will be conducted by taking advantage of the proffered co-operation of Professor L. F. Fieser, of Harvard University. To this end a grant has been obtained from the International Cancer Research Foundation to enable this phase of the work to be carried on by Dr. H. J. Creech under Professor Fieser's direction at Harvard.

The application of the above principle to tuberculosis carried on with the co-operation of Mr. M. O'Sullivan has been confined to testing linkage of organic iodo derivatives to sulphhydryl groups of reduced keratin which itself shows some antigenic activity.

With the assistance of Miss M. M. Shaw, the *in vivo* activity of the isomers of glyceric aldehyde have been tested for possible synergistic activity with the toxic action of irradiation on tumours. The d- and the l-glyceric aldehyde were prepared by Dr. E. Baer, under the direction of Dr. H. O. L. Fischer, and the irradiation carried out in co-operation with the Department of Radiology.

Dr. E. M. Hearne Creech has continued her studies on the *in vitro* activity of water soluble carcinogenic substances on growth and cell division.

With the co-operation of Mr. G. A. Meek, the characteristics of mono-molecular films of the above carcinogenic and related derivatives on surfaces are being studied.

With the assistance of Mr. A. E. Byrnes and Dr. L. D. Proctor, the influence of acute B<sub>1</sub> deficiency on glyoxalase has been studied. The glutathione content of brain in insulin hypoglycaemia has been similarly investigated.

Dr. E. M. Hearne Creech has studied *in vitro* the influence of phagocytosed silica on cell division.

Dr. Franks has studied the influence of the admixture of

actively phagocytosed manganese dioxide on the development of experimental silicosis.

In co-operation with Dr. N. L. Easton, Director of Research of the Ontario Hospitals, Dr. Banting and Dr. Franks have been studying the development of certain refractory states to insulin, following prolonged administration of large doses of the latter.

Dr. Bruno Mendel, with the assistance of Miss F. Strelitz and Miss Mundell, has continued the study of the effect of glyceric aldehyde on the respiration of tumour cells. They found that d-glyceric aldehyde had no effect on the aerobic glycolysis of tumour cells. More recently they found that all the activity of racemic glyceric aldehyde was in the laevo rotatory form of the substance. Both the d- and l-glyceric aldehyde for this work was synthesized by Dr. H. O. L. Fischer and Dr. E. Bear.

Dr. Mendel has also tested a large number of chemical substances for their effect on the respiration and fermentation of the tumour cell, and has continued his investigations of sodium ferricyanide.

The facilities of the laboratory were extended to Dr. H. Krebs, Professor of Biochemistry, Sheffield University, England, during his three weeks' visit, for the purpose of investigating the effect of pancreatectomy on the metabolism of muscle.

Miss H. Ball continued the investigation of tuberculosis, using tuberculin treated with glyceric aldehyde.

The Department of Medical Research wishes to express its appreciation for the co-operation of many of the other departments of the Faculty of Medicine of the University, to Professor H. E. T. Haultain, Department of Mining Engineering, to Professor E. F. Burton, Department of Physics, and to Professor W. R. Graham, Ontario Agricultural College, Guelph.

We also wish to express our thanks for the generous financial assistance given by the Ontario Mining Association and the McIntyre Porcupine Mines for the Silicosis problem, and to the Eli Lilly Company for two fellowships granted for cancer research.

The chief handicap of the Department is lack of space—not only for the work that is being carried on, but also for any fur-

ther expansion. The animal quarters are quite inadequate. It has been necessary this year to accommodate over 2,000 mice in the corridors of the 5th floor.

The department was pleased to be able to assist in financing Professor H. O. L. Fischer's research laboratory in Organic Chemistry, by appointing Dr. J. M. Grosheintz to the staff of the Department of Medical Research and in sharing in the provision for supplies and equipment. We are grateful to Dr. Fischer and his staff for providing us with d- and l-glyceric aldehyde, which has been so useful in the cancer research work of the Department.

During the epidemic of poliomyelitis, two members of this Department developed a respirator which has now reached the stage of commercial manufacture. This respirator promises to be of value in the treatment of a number of conditions in which resuscitation is necessary.

## ART SERVICE

(*Under the direction of Miss Maria T. Wishart*)

Steady work has been done during the past year covering a variety of subjects and technics of which the following are examples:—

Illustrations of ruptured nucleus pulposus for Dr. K. G. McKenzie.

Illustrations of orthopaedic splints for Dr. A. B. LeMesurier, published in a "Symposium on Anterior Poliomyelitis."

Illustrations of jacket used in treatment of scoliosis for Dr. A. B. LeMesurier's paper read before the American Orthopaedic Association, Atlantic City, May, 1938.

Illustrations of extracorporeal thrombosis of dog for Dr. C. H. Best.

Further illustrations of Schick test reactions for Dr. D. T. Fraser, School of Hygiene.

Further steps in Dr. R. M. Janes' lobectomy technic.

Illustration of glomeruli and tubules of kidney sections stained with ferrocyanide, Dr. T. F. Nicholson, Dept. of Pathological Chemistry. Paper to be published shortly.

Pen and ink drawings of "Repair of Cleft Palate", Dr. A. B. LeMesurier, were revised and added to before publication of

his recent article in the *American Journal of Surgery*, February, 1938. The original illustrations were published in the *Canadian Medical Association Journal*, August, 1935. It is interesting and instructive to compare the reproductions in the two journals. Allowing for a difference in the quality of papers used, the *American Journal of Surgery* reproduction is vastly superior not only in workmanship but because the drawings have only been reduced sufficiently for sharpness and not to a point where detail is lost, as is the case in the *Canadian Medical Association Journal*.

At the request of Dr. M. C. Watson we put up an exhibit of work at the Ontario Medical Association Meeting held in Toronto, May third to sixth. The co-operation offered exhibitors made it possible to do this with greater despatch than heretofore. The various members of the Faculty of Medicine who, very kindly, loaned their illustrations and models contributed materially to the success of the exhibit.

### *Summary of Work of Art Service*

#### 1. According to medium of work:

1. Water colour.....	16
2. Pen and ink.....	41
3. Half-tone.....	4
4. Wax models.....	2
5. Crayon sketches.....	1
	—
Total.....	64

#### 2. According to departments:

1. Hygiene.....	9
2. Oto-Laryngology.....	2
3. Obstetrics and Gynaecology.....	1
4. Pathological Chemistry.....	1
5. Pathology, H.S.C.....	1
6. Physiological Hygiene.....	1
7. Surgery.....	48
8. Therapeutics.....	1
	—
Total.....	64

#### 3. Number of members of Faculty for whom work was done. 16

## *Department*

Surgery :		
Dr. W. E. Gallie—Ulner nerve paralysis—Wax model.....	1	
Dr. W. E. Gallie—Femoral hernia—Wax model.....	1	
Dr. K. G. McKenzie—Ruptured nucleus pulposus—Half tone and ink.....	1	
Dr. K. G. McKenzie—Ruptured intravertebral disc—Pen and ink.....	1	
Dr. K. G. McKenzie—Positions of extradural clots—Pen and ink.	1	
Dr. H. Wookey—Oesophagectomy—Pen and ink.....	5	
Dr. R. R. Graham—Surgical procedures in peptic ulcer—Pen and ink.....	5	
Dr. R. M. Janes—Lobectomy—Half tone.....	2	
Dr. R. M. Janes—Ligating pulmonary artery—Pen and ink.....	1	
Dr. S. Gordon—Refrigerated skin grafts—Water colour.....	3	
Dr. J. H. Couch—Splinter through vein—Pen and ink.....	1	
Dr. J. H. Couch—Repair of ventral hernia—Pencil sketch.....	1	
Dr. E. H. Botterell—Head injuries—Pen and ink .....	1	
Surgery H.S.C.:		
Dr. A. B. LeMesurier—Orthopaedic splints—Pen and ink.....	5	
Dr. A. B. LeMesurier—Repair of cleft palate—Pen and ink.....	23	
Dr. A. B. LeMesurier—Scoliosis jacket—Pen and ink.....	1	
Physiological Hygiene :		
Dr. C. H. Best—Extracorporeal thrombosis of dog—Water colour.	1	
Obstetrics and Gynaecology :		
Dr. W. G. Cosbie—Leiomyosarcoma of uterus—Half tone .....	1	
Oto-Laryngology :		
Dr. D. E. S. Wishart—Malignant growth in throat—Water colour	1	
Dr. D. E. S. Wishart—Illustrations of instrument—Pen and ink.	1	
Pathology H.S.C.:		
Dr. I. H. Erb—Reduplication of colon, bladder and uterus—Pen and ink.....	1	
Hygiene :		
Dr. D. Fraser—Schick test reaction charts—Water colour.....	3	
Dr. D. Fraser—Schick test reactions—Water colour.....	6	
Therapeutics :		
Dr. R. F. Farquharson—Test tubes of leukaemic blood—Water colour.....	1	
Pathological Chemistry :		
Dr. T. F. Nicholson—Glomeruli and tubules of kidney sections stained with ferrocyanide—Water colour.....	1	

## REPORT OF THE MEDICAL SOCIETY

Honorary President.....	Dean W. E. Gallie
Honorary Treasurer.....	Dr. R. R. Graham
President.....	E. B. Tovee
Vice-President.....	C. C. Gray
Secretary-Treasurer.....	W. K. Kerr
Assistant Secretary-Treasurer.....	W. E. Ortved

The medical students' administrative organization, the Medical Society, has completed another successful term, characterized by the sound business practices which of recent years have obtained in this office.

*The Medical Journal*, more than ever, remains the outstanding achievement of our undergraduate organization.

Scientific articles contributed by staff members and students alike, cater to the varied interests of all six years. Mr. W. G. Bigelow, Editor-in-Chief, Mr. J. H. Belton, Associate Editor, and Mr. V. R. Perry, Managing Editor, and their staff are to be congratulated upon their success.

The Medical At-Home dance, directed by Mr. C. C. Gray, was a greater success than ever, and the outstanding social event on the campus. Duke Ellington's imported orchestra attracted more patrons than the committee could accommodate.

The traditional medical students' frolic, "Daffydill", lived up to its famous past and was played to capacity houses for three nights.

These social functions sponsored by the Medical Society were all run at a modest profit.

Dr. J. A. Hannah, Chief Medical Officer of the Associated Medical Services Incorporated, gave an interesting lecture to an open meeting of the Medical Society on the subject of Medical Economics, in which he pointed out the advantages of a co-operative basis for organizing the economic relations of patient and doctor.

The fiscal year of the Society was the most satisfactory in its history; a substantial sum was turned over to the Bursary fund and a handsome balance left for the incoming executive.

Over and above these customary activities, this year's Executive has been faced with new problems of student administration.

A Canadian Student Conference held in Winnipeg during the Christmas holidays, applied to the Society for funds to be used for delegates' expenses. It was felt that the degree of interest among the medical students did not justify such expenditure of their money.

A request to appoint a delegate to the recently instituted Toronto Student Assembly was similarly rejected.

The Association of Medical Students formed at Johns Hopkins, April, 1937, has generously sent the medical students here, as elsewhere in Canada, their monthly Journal. This publication has met with considerable interest by the students. It deals principally with ethical, economic and humanitarian aspects of the medical profession.

The question arose whether a local chapter of that organization should be formed here. The Medical Society appointed Mr. W. K. Kerr to deal with this matter.

At a meeting with one of the McGill medical students it was decided that the Medical Society sponsor a conference of delegates from the Eastern Canada Medical Schools. At this conference, held in Toronto on March 13th, 1938, delegates from McGill, Queen's, Western and Toronto Medical Schools, as well as interns from the Kingston and Toronto General Hospitals, formed a "Canadian Association of Medical Students and Interns". A National Executive, resident in Toronto, was elected, with Mr. P. F. McGoe, Chairman, Mr. D. H. Copp, Vice-Chairman, and Mr. W. K. Kerr, Secretary-Treasurer. The purpose of this national organization is to deal with problems of student and intern health, educational matters and such organizational questions as that of solving the present confusion often attending the appointment of interns.

Of invaluable aid in our attempts to serve the student body have been the personal interest and untiring efforts of the Assistant Dean, Dr. Ryerson, and his assistants, Misses Jones, Russell and Perry.

Mr. C. C. Gray, last year's acclaimed Vice-President, was acclaimed President of the incoming executive. His distinguished record in academic and extracurricular activities will ensure the success of the Medical Society for next year.

#### MEDICAL ATHLETIC ASSOCIATION

<i>Honorary President</i> .....	Dr. A. W. Ham
<i>President</i> .....	W. B. Charles
<i>Vice-President</i> .....	B. Laski
<i>Secretary-Treasurer</i> .....	P. F. McGoe

The Medical Athletic Association has concluded another very satisfactory year's activities.

The outstanding feature of this season was the inauguration of the annual Medical Undergraduate Squash Tournament for the James Kinnear Memorial Trophy, donated by the class of 4TO in memory of their recently deceased classmate. This tourney drew an entry list of ninety-five students, that is, more than one-tenth of the total faculty enrolment. Colin Brebner of the graduating class was the initial winner.

More than thirty "M"'s were awarded to the outstanding athletes within the faculty. Three of the letters were granted to ladies of the class of 3T8.

Championships were scarce from our standpoint. The Medical "Thirds" proved this name to be an inadequate one when they nosed out the junior team for the Interfaculty Basketball championship after a very keenly contested all-Medical final. This was the only title garnered by the Association this year. However, the number of medical students engaged in athletics this year was far in excess of previous years.

The Association has tried to co-operate with the University Athletic Directorate in an attempt to teach the junior doctors the fundamentals of games which can be pursued with advantage following graduation. Individual enterprises, such as squash, tennis, golf, skiing, riding and so on are gaining rapidly in popularity without detriment to the interest in traditional team sports.

Financially speaking, the year was a very creditable one. The expenditures approached the full quota allowed by the governing Medical Society. The final inventory showed that next year's executive shall be in possession of considerably more equipment than their predecessors. Undoubtedly the incoming officers may anticipate a very successful year of service.

#### MEDICAL WOMEN'S UNDERGRADUATE ASSOCIATION

<i>Honorary President</i> .....	Dr. A. A. Curtin
<i>President</i> .....	Miss Mary Albertson
<i>Vice-President</i> .....	Miss D. E. Redmond
<i>Secretary</i> .....	Miss D. M. Prowse
<i>Treasurer</i> .....	Miss D. S. Adams

The first open meeting was for the purpose of initiating the Freshettes. The candle-lighting ceremony was very impressive and the latter part of the programme seemed to be enjoyed by the Sophomores quite as much as by the Freshies. The Christmas luncheon party was held at the Diet Kitchen and was a great success. An open meeting was held in February at 44 Hoskin Avenue for the purpose of hearing Macia Campbell tell about the Students' Conference which was held during the

Christmas holidays in Winnipeg. The Medical Women's At Home was held in March at the University Women's Club and was attended by a large number of the staff, graduate women physicians of the city, and students. The women again took part in Daffydill, depicting the pioneer women in Medicine. The Women's Daffydil banquet was an hilarious event with Professor William Boyd as guest speaker. The final meeting of the year was in the form of a party given by the Fifth Year to the graduating class, and was very enjoyable.





